AD-A092 218 O'BRIEN AND GERE ENGINEERS INC PHILADELPHIA PA F/G 13/13
NATIONAL DAM SAFETY PROGRAM. LOOKOVER LAKE DAM (NJ00565), HUDSO--ETC(U)
SEP 80 J J WILLIAMS DACW61-80-D-0013
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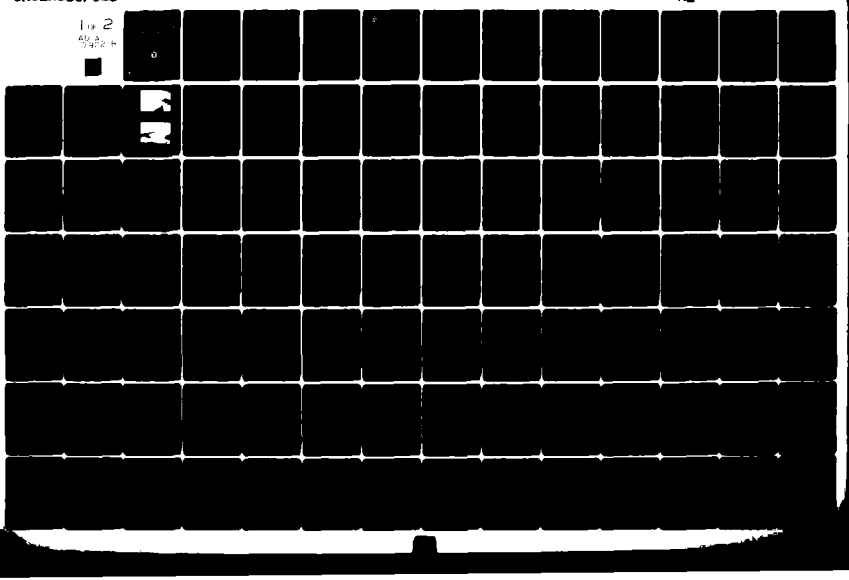

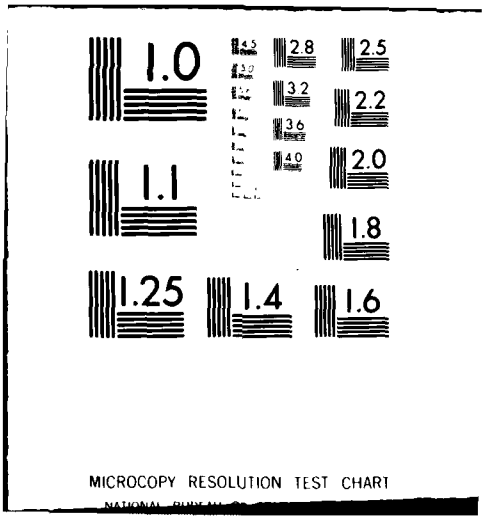
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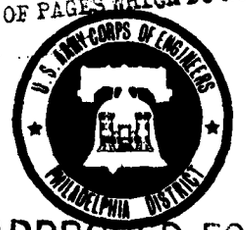
HUDSON RIVER BASIN
LONGHOUSE BROOK
PASSAIC COUNTY
NEW JERSEY

LEVEL

LOOKOVER LAKE DAM

NJ 00565

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



DEPARTMENT OF THE ARMY
Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

SEPTEMBER 1980

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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4. TITLE (and Subtitle): ~~Phase I Inspection Report~~ National Dam Safety Program. Lookover Lake Dam (NJ00565), Hudson River Basin, Longhouse Brook, Passaic County, New Jersey. Phase I Inspection Report. (6)	5. TYPE OF REPORT & PERIOD COVERED: (9) FINAL rept.
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9. PERFORMING ORGANIZATION NAME AND ADDRESS: O'Brien & Gere Engineers Inc. Suite 1760 1617 JFK Blvd. Phila. PA 19103	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dams	National Dam Safety Program
Embankments	Lookover Lake Dam, New Jersey
Visual Inspection	Seepage
Structural Analysis	Spillways

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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DEPARTMENT OF THE ARMY
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CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-N

21 NOV 1980

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Lookover Lake Dam, Passaic County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Lookover Lake Dam, a high hazard potential structure, is judged to be in poor overall condition. Also, the spillway is considered seriously inadequate since a flow equivalent to eight percent of the Spillway Design Flood (SDF) would cause the dam to be overtopped. (The SDF, in this instance, is one half of the Probable Maximum Flood.) The seriously inadequate spillway is assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard of loss of life downstream from the dam. To ensure adequacy of the structure, the following actions, as a minimum, are recommended.

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures, and studies within three months from the date of approval of this report. Any remedial measures necessary to ensure the adequacy of the spillway and to prevent overtopping should be initiated within three months of study completion. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also during periods of unusually heavy precipitation, around the clock surveillance should be provided.

b. The following remedial measures should be initiated within three months from the date of approval of this report:

(1) Outlet works should be designed and installed to allow for emergency drawdown of the reservoir.

(2) The cause of the seepage at the downstream toe of the embankment should be investigated and, if necessary, a means of seepage control should be designed and implemented.

(3) Trees and bushes should be removed from the face of the embankment. Any remaining voids should be filled with suitable, thoroughly compacted material.

(4) Bare spots on the embankment should be seeded to control erosion and riprap should be placed on the upstream slope to provide erosion protection.

(5) The rocks which are partially blocking the entrances to the 36-inch diameter reinforced concrete pipes beneath Cherry Ridge Road should be removed.

(6) The deteriorated concrete on the interior sides of the spillway chute should be repaired.

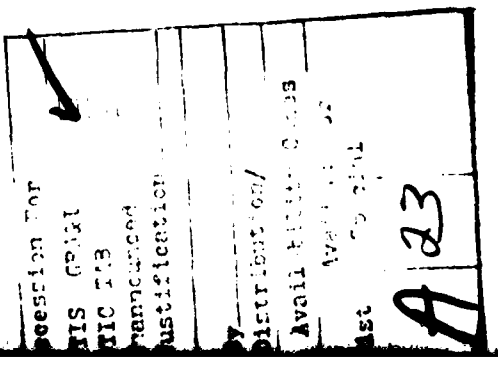
(7) During or following the installation of drawdown facilities, the reservoir should be lowered to permit a survey of the dam (particularly to define the upstream slope) and to assess the extent of sedimentation within the reservoir.

(8) The owner should institute measures to prevent debris and trash buildup on the spillway.

c. The owners should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Roe of the Eighth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.



NAPEN-N
Honorable Brendan T. Byrne

An important aspect of the Dam Inspection Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

Copies furnished:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Regulation
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

LOOKOVER LAKE DAM (NJ00565)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 7 and 28 May 1980 by O'Brien & Gere Engineers, Inc. under contract to the the U.S. Army Engineer District, Philadelphia, in accordance with the National Dam Inspection Act, Public Law 92-367.

Lookover Lake Dam, a high hazard potential structure, is judged to be in poor overall condition. Also, the spillway is considered seriously inadequate since a flow equivalent to eight percent of the SDF would cause the dam to be overtopped. (The SDF, in this instance, is one half of the Probable Maximum Flood.) The seriously inadequate spillway is assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise or corrective measures are completed. The clasification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard of loss of life downstream from the dam. To ensure adequacy of the structure, the following actions, as a minimum, are recommended.

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(8) The owners should institute measures to prevent debris and trash buildup on the spillway.

c. The owners should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

APPROVED: _____
JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 1 Nov 1980

UNSAFE DAM
NATIONAL PROGRAM OF INSPECTION OF DAMS

a. NAME: Lookover Lake Dam

b. ID NO.: NJ00565

c. LOCATION State: New Jersey, County: Passaic.

d. HEIGHT: 24 feet

e. MAXIMUM IMPOUNDMENT

CAPACITY: 52 ac ft.

River or Stream: Longhouse Brook.

Nearest D/S City or Town: Hewitt

f. TYPE: Earthfill with concrete core wall.

g. OWNER: Lookover Lake Property Owners Assoc. & Mr. Elias Lee.

h. DATE GOVERNOR NOTIFIED OF UNSAFE CONDITIONS: 31 Mar 80.

i. CONDITION OF DAM RESULTING IN UNSAFE ASSESSMENT
ASSESSMENT Dam was overtopped on night of 21 March 1980.

l. URGENCY CATEGORY: HIGH HAZARD, UNSAFE, Non-Emergency.

m. EMERGENCY ACTIONS TAKEN:
Gov. notified of this condition by District Engineer's teletype of 31 Mar 80.

j. DESCRIPTION OF DANGER INVOLVED:
Failure of the dam would affect three homes and a motel 2000 ft. downstream.

n. REMEDIAL ACTIONS TAKEN:
N.J.D.E.P. notified dam's owners on 9 Apr 80.

k. RECOMMENDATIONS GIVEN TO GOVERNOR:
The owner should do the following immediately:
a. Conduct detailed H&H studies.
b. Develop an emergency action plan and warning system.
c. Fill all eroded areas.
d. Institute measures to prevent debris and trash buildup on the S/W.
e. Investigate the condition of the stilling basin and riprap, if needed, to prevent undercutting by scouring.

o. REMARKS: Owners have initiated some remedial action recommended.

T.B. HEVERIN, Coordinator
Dam Inspection Program
U.S.A.E.D., Philadelphia

HUDSON RIVER BASIN

NAME OF DAM: LOOKOVER LAKE DAM
COUNTY AND STATE: PASSAIC COUNTY, NEW JERSEY
INVENTORY NUMBER: NJ 00565

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Prepared by:
O'BRIEN & GERE ENGINEERS, INC.

For

DEPARTMENT OF THE ARMY
Philadephia District, Corps of Engineers
Custom House - 2nd & Chestnut Streets
Philadelphia, Pennsylvania 19106

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and anlayses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data availabe to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I REPORT

NATIONAL DAM INSPECTION PROGRAM

Name of Dam:	Lookover Lake Dam ID # NJ 00565
State Located:	New Jersey
County Located:	Passaic
Stream:	Longhouse Brook
Coordinates:	Latitude 41° 9.2', Longitude 74° 23.9'
Dates of Inspection:	May 7, 1980 and May 28, 1980

ASSESSMENT

Based on visual observations made during the inspections, information provided by the New Jersey Department of Environmental Protection (NJDEP) and conversations with the Owners, Lookover Lake Dam is considered to be in poor overall condition.

The dam is an earth embankment approximately 150 feet long with a maximum height of about 10 feet. The top width of the dam is approximately 20 feet and the upstream and downstream slopes appear to be relatively flat. The spillway section has a crest length of 7.2 feet and provides one foot of freeboard between the spillway crest and the top of the dam.

Seepage was noted about one foot above the downstream toe of the dam during the inspections. In addition, several bare spots were observed on the surface of the embankment and trees and bushes were growing from the face of the dam. Portions of the spillway section have been eroded and the entrances to two 36-inch diameter culverts beneath Cherry Ridge Road about 15 feet downstream of the spillway outlet are partially blocked with dumped rock.

The selected Spillway Design Flood (SDF) for this "Small" size, "High" hazard dam is one-half of the Probable Maximum Flood (PMF). Examination of the results of the hydrologic and hydraulic analyses indicates that the spillway is capable of discharging approximately 7 percent of the SDF prior to overtopping of the embankment. Failure of the dam would cause a significant increase in hazard to loss of life downstream. Therefore, the spillway is classified as "Seriously Inadequate", and the dam is classified as "Unsafe (non-emergency)".

Recommendations and remedial measures which should be initiated very soon (within 1 to 3 months) are as follows:

a. Facilities

1. Outlet works should be designed and installed to allow for emergency drawdown of the reservoir.

2. More detailed hydrologic and hydraulic analyses should be performed to determine the need for and type of mitigating measures required to ensure the adequacy of the spillway.

3. The cause of the seepage should be investigated and, if necessary, a means of seepage control should be designed and implemented.

4. Trees and bushes should be removed from the face of the embankment. Any remaining voids should be filled with suitable, thoroughly compacted material.

5. Bare spots on the embankment should be seeded to control erosion and riprap should be placed on the upstream slope to provide erosion protection.

6. The rocks which are partially blocking the entrances to the 36-inch diameter reinforced concrete pipes beneath Cherry Ridge Road should be removed.

7. The deteriorated concrete on the interior sides of the spillway chute should be repaired.

8. During or following the installation of drawdown facilities, the reservoir should be lowered to permit a survey of the dam (particularly to define the upstream slope) and to assess the extent of sedimentation within the reservoir.

b. Operation and Maintenance Procedures

1. The Owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

2. An emergency action plan should be developed which outlines actions to be taken by the Owner to minimize the downstream effects of an emergency. This plan should include an effective warning system.

3. The Owner should institute measures to prevent debris and trash buildup on the spillway.

O'BRIEN & GERE ENGINEERS, INC.

John J. Williams Date: 28 Aug. 80

John J. Williams, P.E.
Vice President
New Jersey Registration No. 24916

UPSTREAM OVERVIEW AS OBSERVED FROM THE RIGHT ABUTMENT
(5/28/80)

DOWNSTREAM OVERVIEW AS OBSERVED FROM THE RIGHT ABUTMENT
(5/28/80)

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TABLE OF CONTENTS
(Continued)

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM
LOOKOVER LAKE DAM
INVENTORY NUMBER - NJ 00565

SECTION 1

PROJECT INFORMATION

1.1 General

a. Authority. This report is authorized by the Dam Inspection Act, Public Law 92-367, and has been prepared in accordance with contract # DACW 61-78-C-0052 between O'Brien & Gere Engineers, Inc. and the United States Army Corps of Engineers, Philadelphia District.

b. Purpose of Inspection. The purpose of this inspection is to evaluate the structural and hydraulic condition of Lookover Lake Dam and appurtenant structures and to determine if the dam constitutes a hazard to human life or property.

1.2 Project Description (Based on information provided by the New Jersey Department of Environmental Protection (NJDEP) and supplemented by field observations).

a. Description of Dam and Appurtenances. Lookover Lake Dam is an earth embankment with a concrete corewall. The dam is approximately 150 feet in length with a maximum height of about 10 feet. The top width of the embankment is about 20 feet and the upstream and downstream slopes are variable, with the steepest sections about 3H:1V.

The spillway is a broad-crested concrete overflow weir located at the left abutment. The crest length of the weir is 7.2 feet and one foot of freeboard is available between the spillway crest and the top of the dam. A 14-foot long concrete chute on a 25 percent slope directs the spillway discharge into a stilling basin at the downstream toe of the dam. Two 36-inch diameter reinforced concrete pipes direct the flow beneath Cherry Ridge Road located about 30 feet downstream of the spillway outlet and into Longhouse Brook.

b. Location. Lookover Lake Dam is located on Longhouse Brook in the Town of Hewitt, New Jersey. The site is shown on the USGS Quadrangle entitled "Wawayanda, N.J. - N.Y." at coordinates N 41° 9.2', W 74° 23.9'. A regional location map of Lookover Lake Dam is included as Figure 1 in Appendix E.

c. Size Classification. Lookover Lake Dam has a maximum height of 10 feet which places it in the "Small" size dam category since it is less than 40 feet high. The maximum storage capacity of 52 acre-feet also falls within the "Small" size classification (less than 1,000 acre-feet). Lookover Lake Dam is therefore classified as a "Small" size structure.

d. Hazard Classification. Three homes are located along the downstream channel banks approximately 1,000 feet downstream of the dam. An embankment has been constructed across Longhouse Brook, creating a small pond, about 2,200 feet downstream of the dam. The Clinton Motel is located along the banks of this pond. A failure of the dam could result in excessive property damage and possible loss of life at these locations. Therefore, Lookover Lake Dam is classified in the "High" hazard potential category.

e. Ownership. Lookover Lake Dam is jointly owned by the Lake Lookover Property Owners Association, Lake Lookover, Hewitt, New Jersey 07421, and Mr. Elias Lee, 133 Cedar Lane, Teaneck, New Jersey 07666. According to a 1931 inspection report, the original owner of the dam was Alfred Hansen of Newfoundland, New Jersey.

f. Purpose of Dam. According to the 1931 inspection report, the original purpose of the dam was for "bungalow" development. Lookover Lake is currently used for recreational purposes only.

g. Design and Construction History. No information is available concerning the original design and construction of the dam. According to Mr. Lee, Co-owner, the dam was built in 1926.

h. Normal Operating Procedures. No records of operating procedures are available for this site.

1.3 Pertinent Data

a. Drainage Area.

Square Miles	1.4

b. Discharge at Dam Site (cfs).

Spillway Capacity	22

c. Elevation (Feet above MSL).

Spillway Crest (Normal Pool)	1,118.5
Top of Dam (Maximum Pool)	1,119.5
Streambed at Downstream Toe of Dam	1,109.5

d. Reservoir Length (Feet).

Normal Pool	1,900
Maximum Pool	1,910

e. Storage (Acre-Feet).

Normal Pool	39
Maximum Pool	52

f. Reservoir Surface Area (Acres).

Normal Pool	13
Maximum Pool	15

g. Dam Data.

Type	Earth
Length	150 Feet
Height	10 Feet
Top Width	20 Feet
Side Slopes (Upstream and Downstream)	Variable, 3H:1V Steepest
Zoning	Unknown
Inpervious Core	Concrete Corewall
Cutoff	Unknown
Grout Curtain	Unknown

h. Spillway.

Type	Concrete Overflow
Crest Length	7.2 Feet
Crest Elevation	1,118.5
Gates	None
Upstream Channel	None
Downstream Channel	Concrete chute to stilling basin to twin 36-inch diameter reinforced concrete pipes to Longhouse Brook

i. Outlet Works. None

SECTION 2

ENGINEERING DATA

2.1 Design

a. Data Available. The only information available from the New Jersey Department of Environmental Protection (NJDEP) consists of correspondence records (from 1964 to the present) and two previous inspection reports (March, 1931 and March, 1980). No design data or drawings are available for this structure.

b. Design Features. The principal design features for this structure are discussed in Section 1.2a.

2.2 Construction

No information relative to the original construction of Lookover Lake Dam is available. The Co-owner, Mr. Lee, stated that the dam was constructed in 1926.

2.3 Operation

No operational data is available for this site.

2.4 Evaluation

a. Availability. All information made available was provided by the NJDEP. No original design or construction information is available.

b. Adequacy. The information made available by NJDEP, conversations with the Co-owner, and observations made during the field investigation provided adequate data for a Phase I evaluation.

c. Validity. There appears to be no reason to question the validity of the data provided by the NJDEP.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General. The field inspections of Lookover Lake Dam took place on May 7, 1980 and May 28, 1980. At the time of the inspections, the reservoir water surface was approximately 2 inches above the spillway crest elevation. No underwater areas were inspected. The observations and comments of the field inspection team are in the checklist which is Appendix B of this report. The appearance of the facility indicates that the dam is marginally maintained.

b. Dam. The top of the embankment was lined with sandbags on the dates of the inspections. The sandbags increase the crest elevation of the dam by about one foot.

Portions of the embankment have no vegetative cover. Mr. Lee, Co-owner of the dam, stated that earth material had recently been placed on the surface of the embankment at locations that had been washed out in the flood of March, 1980. Mr. Lee stated that the embankment was to be reseeded, but no seeding had taken place by the date of the second inspection (May 28, 1980). In addition, no riprap was apparent on the upstream slope of the dam.

Seepage was noted during the inspections at the downstream toe of the embankment near the longitudinal center of the dam. The saturated area extends about one foot above the toe and the quantity of flow appears to be less than one gallon per minute (gpm).

Several trees (15 to 20 feet high) and a number of bushes were observed growing from the surface of the embankment.

c. Appurtenant Structures. Rocks (average size-12 inches) had recently been dumped in the vicinity of the spillway stilling basin. According to Mr. Lee, this is to prevent erosion of the stilling basin during significant spillway overflow conditions. At the time of the inspections, some of the dumped rock was partially blocking the entrances to the 36-inch diameter reinforced concrete pipes beneath Cherry Ridge Road.

Significant erosion and undermining of the concrete has occurred along the interior sides of the spillway chute.

No system of outlet works is available at this site.

d. Reservoir Area. Some sedimentation deposits were observed along the upstream slope of the dam during the inspections, but the extent of the siltation was not apparent. There is no evidence of instability of the reservoir slopes for Lookover Lake. The slopes surrounding the reservoir range between 10 and 20 percent and they are mostly forest covered.

e. Downstream Channel. Spillway discharge is directed through the spillway chute, into the rock lined stilling basin and through the two 36-inch diameter reinforced concrete pipes.

SECTION 4

OPERATIONAL FEATURES

4.1 Procedures

No outlet works have been provided for Lookover Lake Dam. A metal post in the center of the spillway crest allows for the placement of flashboards. However, it is not known if flashboards have ever been used at this site.

4.2 Maintenance of Dam

According to Mr. Lee, no regular maintenance program has been established for Lookover Lake Dam. Repairs to the dam were recently effected following erosion of the embankment and spillway during the March, 1980 flood.

4.3 Maintenance of Operating Facilities

No operating facilities are maintained at Lookover Lake Dam.

4.4 Description of Any Warning Systems in Effect

According to Mr. Lee, no system of warning downstream residents in the event of an overtopping flood or a breach flood exists at this site.

4.5 Evaluation of Operational Adequacy

Outlet works should be designed and installed to allow for emergency drawdown of the reservoir.

A periodic inspection and maintenance program should be implemented and a formal warning system should be established.

SECTION 5

HYDRAULICS AND HYDROLOGY

5.1 Evaluation of Features

a. Design Data. No hydrologic or hydraulic design data was available with the information provided by the New Jersey Department of Environmental Protection (NJDEP). Lookover Lake has a total drainage area of 1.4 square miles. Bearfort Waters, which is located immediately upstream of Lookover Lake, drains 1.1 square miles of the total drainage area. The spillway at Lookover Lake Dam has an estimated discharge capacity of 22 cfs.

For further information, refer to the calculations and computer printout included in Appendix C of this report.

b. Experience Data. No rainfall or reservoir level records are maintained at this site. According to the correspondence obtained from NJDEP, the dam was overtopped on August 5, 1969, causing damage to the embankment and spillway section. Repairs were effected, but on March 21, 1980, the dam was overtopped again and damage occurred to the embankment as described in previous sections. According to an employee of the Clinton Motel, the most recent overtopping resulted in approximately 3 inches of water in the lower levels of the motel and water in at least one of the houses downstream of the dam. The lower level of the motel is located about 4 feet above the normal stream elevation.

c. Visual Observations. On the dates of the inspections, the entrances to the 36-inch diameter reinforced concrete pipes were partially blocked with dumped rock. This situation would not directly affect the dam, but it could cause overtopping of the Cherry Ridge Road downstream of the dam during periods of high flow.

d. Overtopping Potential. The recommended Spillway Design Flood (SDF) range for a "Small" size, "High" hazard dam is from one-half of the Probable Maximum Flood (PMF) to the full PMF. Due to the small storage capacity of the reservoir, the selected SDF is one-half of the PMF. The SDF was synthesized from one-half of the Probable Maximum Precipitation (PMP) using the SCS unit hydrograph for Bearfort Waters and for Lookover Lake. The inflow hydrograph to Bearfort Waters was routed through the dam and combined with the inflow hydrograph to Lookover Lake. The resulting SDF hydrograph was routed through Lookover Lake with the initial water surface elevation at the spillway crest. The peak inflow and outflow rates for the SDF were computed to be 3,168 cfs and 3,069 cfs, respectively. The spillway is capable of discharging approximately 7 percent of the SDF prior to overtopping of the embankment (refer to Appendix C for computations and the computer printout).

e. Spillway Adequacy. A dam break analysis was performed to evaluate the "hazard to loss of life downstream from the dam from that which would exist just before overtopping failure" (ETL 1110-2-234, 10 May, 1978). The breach was assumed to occur at approximately 28 percent of the SDF (14 percent of the PMF) with the reservoir surface one foot above the top of the dam (two feet above the spillway crest). The flow at the hazard area prior to failure of the dam was computed to be 699 cfs with a corresponding flow depth of 5.5 feet (2.5 feet above the channel banks). The breach flow at the hazard area was computed to be 3,014 cfs with a corresponding flow depth of 9.5 feet (6.5 feet above the channel banks). The sill elevation of the lowest house in the hazard area is approximately the same as the elevation of the channel banks. A failure of the dam is considered to significantly increase the hazard to loss of life downstream. In accordance with ETL 1110-2-234, 10 May, 1978, a spillway shall be considered "Seriously Inadequate" if all three of the following conditions exist:

a. There is high hazard to loss of life from large flows downstream of the dam.

b. Dam failure resulting from overtopping would sufficiently increase the hazard to loss of life downstream from the dam from that which would exist just before overtopping failure.

c. The spillway is not capable of passing one-half of the probable maximum flood without overtopping the dam and causing failure.

Since all three of these conditions exist, the Lookover Lake Dam spillway is classified as "Seriously Inadequate".

SECTION 6

STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations. Seepage (less than 1 gpm) was observed near the downstream toe of the embankment during the inspections. The seepage presently appears to be clear; however, increased seepage could result in a migration of fine material and structrual damage to the embankment. The seepage could also indicate that the concrete corewall is in poor condition.

The trees growing from the surface of the embankment present potential hazards to the structural integrity of the dam. The root systems create seepage paths through the embankment and, if uprooted during severe wind conditions, could remove portions of the embankment. In addition, the dam could be subjected to extensive erosion in the event of overtopping due to the lack of vegetation on the surface of the embankment.

b. Design and Construction Data. No design or construction data is available for Lookover Lake Dam.

c. Operating Records. No operating facilities exist at this site.

d. Post Construction Changes. According to the correspondence provided by the New Jersey Department of Environmental Protection (NJDEP), the embankment and spillway sections were reconstructed (with no design modifications) following the overtopping in 1969. Representatives of the NJDEP and the Army Corps of Engineers inspected Lookover Lake Dam following the March, 1980 overtopping, and the following "immediate remedial actions" were recommended (a copy of the teletype letter from the Corps of Engineers to N.J. Governor Brendan T. Byrne is included on pages 4 and 5 of Appendix E):

1. Fill eroded areas on both sides of the spillway with pervious material meeting NJDOT 1A specifications.

2. Dress up the eroded downstream slopes.

3. A detailed emergency operation plan and warning system should be promptly developed. During periods of unusually heavy precipitation, around the clock surveillance should be provided.

4. Institute measures to prevent debris and trash buildup on the spillway.

5. Investigate the condition of the stilling basin area especially with regard to undercutting of the spillway by scouring. Riprap the toe of the spillway, if needed.

As of the date of the second inspection, it appeared that recommendations 1, 2 and 5 had been implemented (although no seeding had been provided for the regraded portions of the embankment).

e. Seismic Stability. Lookover Lake Dam is located in Seismic Zone 1 on the "Seismic Zone Map of Contiguous States". A dam located in Seismic Zone 1 is generally considered to be safe under expected earthquake loadings in this zone if it is stable for static loading conditions. Based on the field inspections, Lookover Lake Dam appears to be stable for static conditions.

SECTION 7

ASSESSMENT, RECOMMENDATIONS, AND PROPOSED REMEDIAL MEASURES

7.1 Dam Assessment

a. Safety. The visual observations and review of available information indicate that Lookover Lake Dam is in poor condition. The deficiencies and problem areas noted in Sections 3.1b, 3.1c, 5.1b, 5.1e, and 6.1a indicate a general lack of maintenance and an inadequate original design.

The selected SDF for this structure is one-half of the PMF. The spillway is capable of discharging approximately 7 percent of the SDF prior to overtopping of the embankment. Failure of the dam by overtopping would result in a significant increase in hazard to loss of life downstream of the dam. Therefore, the spillway is classified as "Seriously Inadequate", and the dam is classified as "Unsafe (non-emergency)".

b. Adequacy of Information. The information provided by the New Jersey Department of Environmental Protection (NJDEP), conversations with the Co-owner and observations made during the field investigations provided adequate data for a Phase I evaluation.

c. Urgency. The recommendations and remedial measures described in Section 7.2 should be initiated very soon (within 1 to 3 months).

d. Necessity for Further Evaluation. Further investigations should be performed in accordance with Section 7.2a, Items 2 and 3.

7.2 Recommendations and Proposed Remedial Measures

a. Facilities.

1. Outlet works should be designed and installed to allow for emergency drawdown of the reservoir.

2. More detailed hydrologic and hydraulic analyses should be performed to determine the need for and type of mitigating measures required to ensure the adequacy of the spillway.

3. The cause of the seepage should be investigated and, if necessary, a means of seepage control should be designed and implemented.

4. Trees and bushes should be removed from the face of the embankment. Any remaining voids should be filled with suitable, thoroughly compacted material.

5. Bare spots on the embankment should be seeded to control erosion and riprap should be placed on the upstream slope to provide erosion protection.

6. The rocks which are partially blocking the entrances to the 36-inch diameter reinforced concrete pipes beneath Cherry Ridge Road should be removed.

7. The deteriorated concrete on the interior sides of the spillway chute should be repaired.

8. During or following the installation of drawdown facilities, the reservoir should be lowered to permit a survey of the dam (particularly to define the upstream slope) and to assess the extent of sedimentation within the reservoir.

b. Operation and Maintenance Procedures.

1. The Owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

2. An emergency action plan should be developed which outlines actions to be taken by the Owner to minimize the downstream effects of an emergency. This plan should include an effective warning system.

3. The Owner should institute measures to prevent debris and trash buildup on the spillway.

APPENDIX

A

Check List Engineering Data

Design, Construction, Operation

Phase I

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Lookover Lake Dam

ID # NJ 00565

ITEM	REMARKS
AS-BUILT DRAWINGS	Refer to Appendix E, Page 2
REGIONAL VICINITY MAP	Refer to Appendix E, Figure 1, Page 1
CONSTRUCTION HISTORY	The dam was originally built in 1926, reconstructed in 1969, and reconstructed again in 1980.
TYPICAL SECTIONS OF DAM	Refer to Appendix E, Page 3
OUTLETS - PLAN	There is no outlet system for drawdown of the lake.
DETAILS	
CONSTRAINTS	
DISCHARGE RATINGS	None available
RAINFALL/RESERVOIR RECORDS	None available

ITEM	REMARKS
DESIGN REPORTS	No design reports available
GEOLOGY REPORTS	None provided. Refer to Appendix F of this report.
DESIGN COMPUTATIONS	No data available
HYDROLOGY & HYDRAULICS	No data available
DAM STABILITY	No data available
SEEPAGE STUDIES	No data available
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	No information available
POST-CONSTRUCTION SURVEYS OF DAM	None
BORROW SOURCES	There is no record of where borrow material came from.

ITEM	REMARKS
MONITORING SYSTEMS	None
MODIFICATIONS	The dam was rebuilt in 1969 and 1980, to its previous configuration.
HIGH POOL RECORDS	Overtopping failures in 1969 and 1980, but actual maximum depth of flow in both cases was not recorded.
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	In 1969, the embankment washed out and the spillway was destroyed. In 1980, the embankment washed out in several locations.
MAINTENANCE OPERATION RECORDS	None available

ITEM	REMARKS
SPILLWAY PLAN SECTIONS DETAILS	Refer to Appendix E, Page 2
OPERATING EQUIPMENT PLANS & DETAILS	None
MISCELLANEOUS	

APPENDIX

B

Check List

Visual Inspection

Phase I

CHECK LIST
VISUAL INSPECTION
PHASE I

Name Dam Lookover Lake Dam County Passaic State New Jersey National ID # NJ00565

Type of Dam Earth Hazard Category High

Date(s) Inspection May 7, 1980 Weather Clear Temperature 70° F
May 28, 1980 Clear 70° F

Pool Elevation at Time of Inspection 1118.7 M.S.L. Tailwater at Time of Inspection ±1109 M.S.L.

Inspection Personnel:

Lee DeHeer Robert Bowers Paul Pettit

Robert Bowers Recorder

Remarks:

Mr. Lee, co-owner of the dam, and Mr. James Kearns and Mr. Larry Lindgren of the NJDEP were also present during the inspection.

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None Observed	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None Observed	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	None Observed	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	Horizontal alignment appeared satisfactory. Crest of dam increases from 1.0 foot above the spillway crest at the right sidewall of the spillway to 1.7 feet above the spillway crest at the right abutment.	
RIPRAP FAILURES	No failures were observed, however, riprap was observed partially blocking the 36" reinforced concrete culverts under Cherry Ridge Rd. about 30' downstream of the spillway.	Remove rock from culverts. Install riprap on upstream face of dam embankment for wave protection.

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	No problems observed	
ANY NOTICEABLE SEEPAGE	Seepage noted at the downstream toe of the embankment near the longitudinal center of the dam. The saturated area extends about 1 foot above the toe and the quantity of flow appears to be less than 1 gpm.	Investigate the cause of the seepage and if necessary a means of seepage control should be designed and implemented.
STAFF GAGE AND RECORDER	None on site	
DRAINS	None Observed	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	No problems observed structurally. Hydraulically, it is too short.	Detailed hydrologic & hydraulic analyses should be performed to determine the measures required for safely passing the SDF.
APPROACH CHANNEL	None	
DISCHARGE CHANNEL	Spillway discharge is directed through the spillway chute, into the rock lined stilling basin and through the two 36" diameter reinforced concrete pipes into Longhouse Brook.	Refer to comment under "riprap failures" - Rocks should be removed from the pipes.
BRIDGE AND PIERS	Not Applicable	

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None Observed	
OBSERVATION WELLS	None Observed	
WEIRS	None Observed	
PIEZOMETERS	None Observed	
OTHER		

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	The slopes surrounding the reservoir range between 10 and 20 percent and they are mostly forest covered.	
SEDIMENTATION	Some sedimentation desposits were observed along the upstream slope of the dam. The extent of the situation is not apparent. There is no evidence of instability of the reservoir slopes.	Consideration could be given for removal of sediment from the impoundment to improve storage capabilities.

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	4 road crossings with constrictive culverts between Lookover Lake and Mt. Laurel Lake (about 2,500 feet). This reach is also essentially heavily wooded with many trees causing obstructions to higher levels of discharge.	
SLOPES	Channel invert slopes about one percent between Lookover Lake and Mt. Laurel Lake (about 2,500 feet)	
APPROXIMATE NO. OF HOMES AND POPULATION	3 homes and a small motel. As many as 30 to 40 people could be affected.	An emergency action plan should be developed which outlines actions to be taken by the Owner to minimize the downstream effects of an emergency. The plan should include an effective warning system.

APPENDIX

C

Hydrologic & Hydraulic Data

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
Lookover Lake Dam, Phila COE, Open End				

APPENDIX C
HYDROLOGIC & HYDRAULIC DATA
TABLE OF CONTENTS

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
LOOKOVER LAKE DAM	1	RRB	5/15/80	1600-006-104

HYDROLOGY CALCULATIONS

DRAINAGE AREA (PLANIMETERED FROM USGS QUAD SHEETS): 1.4 SQUARE MILES

BEARFORT WATERS SUB-BASIN: 1.1 SQ. MI.; LOOKOVER LAKE SUB-BASIN: 0.3 MI^2

PMP CALCULATIONS (HMR 33)

AREA IS IN ZONE 1

24 HR., 200 SQ. MI. RAINFALL = 22 INCHES

6 HR. % FOR 0.3 $MI.^2$ RAINFALL = 111
12 HR. % " " " " = 123
24 HR. % " " " " = 133
48 HR. % " " " " = 142

UNIT HYDROGRAPH LAG TIME

USE SCS UNIT HYDROGRAPH - UPLAND METHOD

BEARFORT WATERS

LONGEST DRAINAGE PATH IS A RESULT OF OVERLAND FLOW

$T = L/V$ WHERE V IS DETERMINED FROM THE SCS NOMOGRAPH (P. 15-8, HYDROLOGY SECTION 5) FOR A WOODLAND CONDITION.

EASTERN PATH

OVERLAND FLOW: $L_1 = 2,000$ FEET AT $S = 260/2,000 = .13$ OR 13 %

AND $L_2 = 1,500$ FEET AT $S = 50/1,500 = .033$ OR 3.3 %

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
LOOKOVER LAKE DAM	2	RRB	5/15/80	1800.006-104

FROM NOMOGRAPH, $V_1 \approx 1.8$ FT./SEC.; $V_2 \approx 0.9$ FT./SEC.

$T_1 = L_1/V_1 = 2{,}000 \text{ FT.}/1.8 \text{ FT/SEC.} = 0.31$ HRS.; $T_2 = L_2/V_2 = 0.46$ HRS.

$T = 0.74$ HRS. → LAG TIME $L = 0.6\,T =$ **0.44 HRS.**

LOOKOVER LAKE

DRAINAGE IS A RESULT OF OVERLAND FLOW

EASTERN PATH

OVERLAND FLOW: $L = 4{,}000$ FT., $S = 340/4{,}000 = .085$ OR 8.5%

FROM NOMOGRAPH, $V \approx 1.5$ FT./SEC.

$T = L/V = 4{,}000/1.5 = 2666$ SEC. $= 0.74$ HRS.

LAG TIME $L = 0.6\,T =$ **0.44 HOURS**

CHECK LAG TIME BY OTHER METHODS

SCS CURVE NUMBER METHOD:

$$L = \frac{\ell^{0.8}(S+1)^{0.7}}{1900\,Y^{0.5}}$$

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
LOOKOVER LAKE DAM	2A	RRB	5/15/80	

ℓ = HYD. LENGTH OF WATERSHED IN FEET = 5000 FT.

$S = \frac{1000}{CN} - 10 = \frac{1000}{55} - 10 = 8.18$

Y = AVG. WATERSHED SLOPE IN % $= \frac{1450 - 1125}{5000} = 6.5\%$

$$L = \frac{5000^{0.8}(8.18+1)^{0.7}}{1900\,(6.5)^{0.5}} = 0.89 \text{ HOURS}$$

CALIFORNIA HIGHWAYS METHOD :

$$T = \left(\frac{11.9\,L^3}{H}\right)^{0.385} = \left(\frac{11.9\,(0.95 \text{ MILES})^3}{165 \text{ FT.}}\right)^{0.385}$$

$T = 0.34$ HRS., $L = 0.6\,(0.34) = 0.20$ HOURS

NAVDOCKS METHOD :

FOR SLOPE $= \frac{165}{5000} = 3.3\%$, AVG. $V = 3$ FT./SEC.

$T = L/V = 5000 \text{ FT} / 3 \text{ FT/SEC.} = 1670$ SEC.

$T_c = 0.46$ HOURS, $L = 0.6\,T_c = 0.28$ HOURS

SCS UPLAND METHOD IS MOST REPRESENTATIVE, USE **$L = 0.44$ HOURS**

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
LOOKOVER LAKE DAM	3	RRB	9/15/80	1800-006-104

RESERVOIR SURFACE AREAS

ELEV.	SURF. AREA (ACRES)	STORAGE (ACRE-FEET) (COMPUTED BY HEC-1 PROGRAM)
BEARFORT WATERS		
1120	0	0
1130	28	93
1160	134	2326
1180	257	6170
LOOKOVER LAKE		
1109.5	0	0
1118.5	13	39
1140	31	498
1160	57	1365

DISCHARGE CALCULATIONS

LOOKOVER LAKE → SPILLWAY DISCHARGE → $Q_S = CLH^{3/2}$ WHERE C = 3.1 AND L = 7.2 FT.

SPWY. DISCHARGE CAPACITY PRIOR TO OVERTOPPING → H = 1 FT., Q = 22 CFS

DAM OVERFLOW → $Q_D = CLH^{3/2}$ WHERE C = 2.9 AND L ≈ 150 FT.

IN ADDITION, SOME FLOW MAY OCCUR OVER THE ABUTMENTS,

$Q_A = CLH^{3/2}$ WHERE C = 2.8 AND L VARIES.

(OVER)

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
LOOKOVER LAKE DAM	4	RRB	5/15/80	1800-006-104

STAGE-DISCHARGE TABLE (LOOKOVER LAKE DAM)

RESERVOIR SURF. ELEV.	H_S (FT.)	Q_S (CFS)	H_D (FT.)	Q_D (CFS)	H_A (FT.)	L_{AEFF} (FT.)	Q_A (CFS)	Q_{TOTAL}
1118.5	0	0	–	–	–	–	–	0
1119.0	0.5	8	–	–	–	–	–	8
1119.5	1	22	0	0	0	0	0	22
1120.5	2	63	1	435	1	7	20	518
1121.5	3	116	2	1,230	2	14	111	1,457
1123.5	5	250	4	3,480	4	28	627	4,357
1128.5	10	706	9	11,745	9	63	4,763	17,214
1133.5	15	1,297	14	22,787	14	100	14,667	38,751

BEARFORT WATERS → SPILLWAY IS A RECTANGULAR OPENING, 5' WIDE BY 2' HIGH. WEIR FLOW UNTIL FULL, THEN ORIFICE-CONTROLLED FLOW. 2.5 FEET OF FREEBOARD IS AVAILABLE TO THE TOP OF THE DAM.

WEIR FLOW → $Q_S = CLH^{3/2}$ WHERE $C = 3.2$ AND $L = 5$ FT.; ORIFICE FLOW → $Q_S = CA\sqrt{2gh}$ WHERE $C = 0.6$, $A = 10$ FT.^{2}, h = DIST. FROM RES. SURF. TO CENTER OF OPENING

SPWY. DISCHARGE CAPACITY PRIOR TO OVERTOPPING IS ABOUT 60 CFS.

DAM OVERFLOW → $Q_D = CLH^{3/2}$ WHERE $C = 3.0$ AND $L = 180$ FT.

IN ADDITION, SOME FLOW MAY OCCUR OVER THE ABUTMENTS:

$Q_A = CLH^{3/2}$ WHERE $C = 2.8$ AND L VARIES

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
LOOKOVER LAKE DAM	5	RRB	5/15/80	1800-006-104

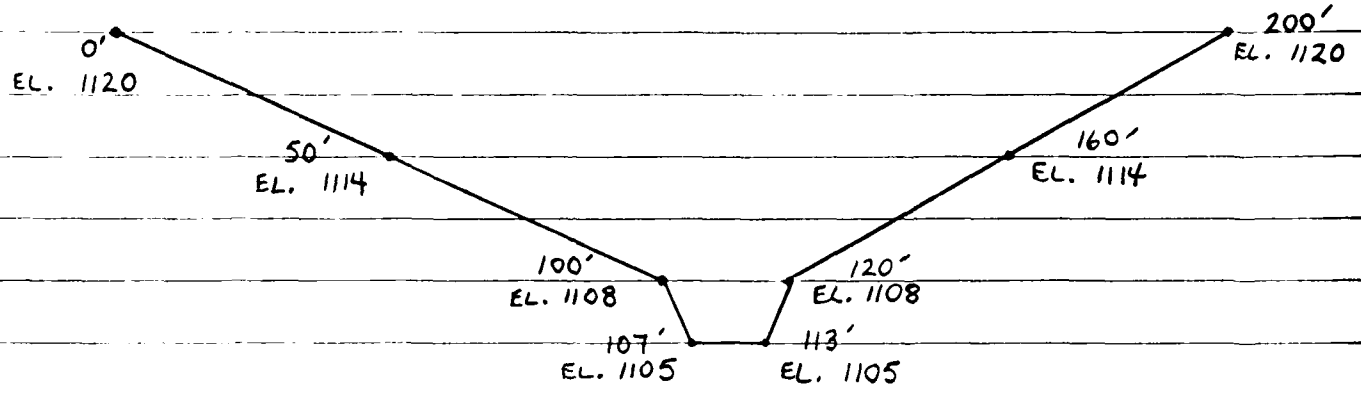
STAGE - DISCHARGE TABLE (BEARFORT WATERS DAM)

RESERVOIR SURF. ELEV.	H_S (FT.)	Q_S (CFS)	H_O (FT.)	Q_O (CFS)	H_A (FT.)	$L_{A_{EFF}}$ (FT)	Q_A (CFS)	Q_{TOTAL}
1130	0	0	—	—	—	—	—	0
1131	1	16	—	—	—	—	—	16
1132	2	45	—	—	—	—	—	45
1132.5	2.5	59	0	0	0	0	0	59
1133	3	68	0.5	191	0.5	10	10	269
1135	5	96	2.5	2,135	2.5	50	553	2,784
1140	10	144	7.5	11,091	7.5	150	8,627	19,862
1145	15	180	12.5	23,865	12.5	250	30,936	54,08

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
Lookover Lake Dam	6	RRB	5/15/80	1800-006-104

CHANNEL CROSS-SECTION AT HAZARD AREA



CHANNEL LENGTH ≈ 1000 FT.

CHANNEL SLOPE = 5 FT./1000 FT. = .005 OR .5%

MANNING'S COEFFICIENTS: OVERBANKS $n = .06$

CHANNEL $n = .04$

SILL ELEVATION OF LOWEST HOUSE ≈ EL. 1108

(HOUSE IS RIGHT ON CHANNEL BANK)

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
  LAST MODIFICATION  26 FEB 79
**********
     1              A1                        NATIONAL DAM INSPECTION PROGRAM
     2              A2                              LOOKOVER LAKE DAM
     3              A3                             HYDROLOGIC ANALYSIS
     4              B    300       0      10       0       0       0       0       0      -3       0
     5              B1     5
     6              J      1       9       1
     7              J1   .05     .10     .15     .20     .25     .30     .50     .75    1.0
     8              K      0  INFLOW                                       1
     9              K1                        INFLOW TO BEARFORT WATERS
    10              M      1       2     1.1             1.4                                    1
    11              P      0      22     111     123     133     142
    12              T                                                   1.0     .05
    13              W2           0.44
    14              X   -1.5    -.05       2
    15              K      1  OUTFLO                                       1
    16              K1                        OUTFLOW FROM BEARFORT WATERS
    17              Y                                 1       1
    18              Y1     1                                                -1130      -1
    19              Y4  1130    1131    1132  1132.5    1133    1135    1140    1145
    20              Y5     0      16      46      59     269    2784   19862   54081
    21              $A     0      28     134     257
    22              $E  1120    1130    1160    1180
    23              $$  1130
    24              $D1132.5
    25              K      0  INFLOW                                       1
    26              K1                             INFLOW TO LOOKOVER LAKE
    27              M      1       2     0.3             1.4                                    1
    28              P      0      22     111     123     133     142
    29              T                                                   1.0     .05
    30              W2           0.44
    31              X   -1.5    -.05       2
    32              K      2  COMBIN                                       1
    33              K1                   COMBINE INFLOW AND BEARFORT WATERS OUTFLOW
    34              K      1  OUTFLO                                       1
    35              K1                          OUTFLOW FROM LOOKOVER LAKE DAM
    36              Y                                 1       1
    37              Y1     1                                               -1118.5      -1
    38              Y41118.5    1119  1119.5  1120.5  1121.5  1123.5  1128.5  1133.5
    39              Y5     0       8      22     518    1457    4357   17214   38751
    40              $A     0      13      31      57
    41              $E1109.5  1118.5    1140    1160
    42              $$1118.5
    43              $D1119.5
    44              K     99
```

Sh 7

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
****

RUN DATE= 06/04/80.
TIME= 12.39.16.

NATIONAL DAM INSPECTION PROGRAM
LOOKOVER LAKE DAM
HYDROLOGIC ANALYSIS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPPT	NSTAN
300	0	10	0	0	0	0	0	-3	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 9 LRTIO= 1

RTIOS=	.05	.10	.15	.20	.25	.30	.50	.75	1.00

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INFLOW TO BEARFORT WATERS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
INFLOW	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	1.10	0.00	1.40	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.00	111.00	123.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= .44

RECESSION DATA
STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 15 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .44 VOL= 1.00

416.	732.	1013.	894.	579.	330.	202.	120.	71.	42.

Sh 8

Q — END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.10	1	.00	0.00	.00	2.	1.02	1.10	151	.02	.01	.01	45.
1.01	.20	2	.00	0.00	.00	1.	1.02	1.20	152	.02	.01	.01	46.
1.01	.30	3	.00	0.00	.00	1.	1.02	1.30	153	.02	.01	.01	47.
1.01	.40	4	.00	0.00	.00	1.	1.02	1.40	154	.02	.01	.01	47.
1.01	.50	5	.00	0.00	.00	1.	1.02	1.50	155	.02	.01	.01	47.
1.01	1.00	6	.00	0.00	.00	1.	1.02	2.00	156	.02	.01	.01	48.
1.01	1.10	7	.00	0.00	.00	1.	1.02	2.10	157	.02	.01	.01	48.
1.01	1.20	8	.00	0.00	.00	1.	1.02	2.20	158	.02	.01	.01	48.
1.01	1.30	9	.00	0.00	.00	1.	1.02	2.30	159	.02	.01	.01	48.
1.01	1.40	10	.00	0.00	.00	1.	1.02	2.40	160	.02	.01	.01	48.
1.01	1.50	11	.00	0.00	.00	1.	1.02	2.50	161	.02	.01	.01	48.
1.01	2.00	12	.00	0.00	.00	1.	1.02	3.00	162	.02	.01	.01	48.
1.01	2.10	13	.00	0.00	.00	1.	1.02	3.10	163	.02	.01	.01	48.
1.01	2.20	14	.00	0.00	.00	1.	1.02	3.20	164	.02	.01	.01	48.
1.01	2.30	15	.00	0.00	.00	1.	1.02	3.30	165	.02	.01	.01	48.
1.01	2.40	16	.00	0.00	.00	1.	1.02	3.40	166	.02	.01	.01	48.
1.01	2.50	17	.00	0.00	.00	1.	1.02	3.50	167	.02	.01	.01	48.
1.01	3.00	18	.00	0.00	.00	0.	1.02	4.00	168	.02	.01	.01	48.
1.01	3.10	19	.00	0.00	.00	0.	1.02	4.10	169	.02	.01	.01	48.
1.01	3.20	20	.00	0.00	.00	0.	1.02	4.20	170	.02	.01	.01	48.
1.01	3.30	21	.00	0.00	.00	0.	1.02	4.30	171	.02	.01	.01	48.
1.01	3.40	22	.00	0.00	.00	0.	1.02	4.40	172	.02	.01	.01	48.
1.01	3.50	23	.00	0.00	.00	0.	1.02	4.50	173	.02	.01	.01	48.
1.01	4.00	24	.00	0.00	.00	0.	1.02	5.00	174	.02	.01	.01	48.
1.01	4.10	25	.00	0.00	.00	0.	1.02	5.10	175	.02	.01	.01	48.
1.01	4.20	26	.00	0.00	.00	0.	1.02	5.20	176	.02	.01	.01	48.
1.01	4.30	27	.00	0.00	.00	0.	1.02	5.30	177	.02	.01	.01	48.
1.01	4.40	28	.00	0.00	.00	0.	1.02	5.40	178	.02	.01	.01	48.
1.01	4.50	29	.00	0.00	.00	0.	1.02	5.50	179	.02	.01	.01	48.
1.01	5.00	30	.00	0.00	.00	0.	1.02	6.00	180	.02	.01	.01	48.
1.01	5.10	31	.00	0.00	.00	0.	1.02	6.10	181	.06	.05	.01	56.
1.01	5.20	32	.00	0.00	.00	0.	1.02	6.20	182	.06	.05	.01	85.
1.01	5.30	33	.00	0.00	.00	0.	1.02	6.30	183	.06	.05	.01	124.
1.01	5.40	34	.00	0.00	.00	0.	1.02	6.40	184	.06	.05	.01	159.
1.01	5.50	35	.00	0.00	.00	0.	1.02	6.50	185	.06	.05	.01	182.
1.01	6.00	36	.00	0.00	.00	0.	1.02	7.00	186	.06	.05	.01	195.
1.01	6.10	37	.00	0.00	.00	0.	1.02	7.10	187	.06	.05	.01	203.
1.01	6.20	38	.00	0.00	.00	0.	1.02	7.20	188	.06	.05	.01	208.
1.01	6.30	39	.00	0.00	.00	0.	1.02	7.30	189	.06	.05	.01	210.
1.01	6.40	40	.00	0.00	.00	0.	1.02	7.40	190	.06	.05	.01	212.
1.01	6.50	41	.00	0.00	.00	0.	1.02	7.50	191	.06	.05	.01	213.
1.01	7.00	42	.00	0.00	.00	0.	1.02	8.00	192	.06	.05	.01	214.
1.01	7.10	43	.00	0.00	.00	0.	1.02	8.10	193	.06	.05	.01	214.
1.01	7.20	44	.00	0.00	.00	0.	1.02	8.20	194	.06	.05	.01	214.
1.01	7.30	45	.00	0.00	.00	0.	1.02	8.30	195	.06	.05	.01	214.
1.01	7.40	46	.00	0.00	.00	0.	1.02	8.40	196	.06	.05	.01	214.
1.01	7.50	47	.00	0.00	.00	0.	1.02	8.50	197	.06	.05	.01	214.
1.01	8.00	48	.00	0.00	.00	0.	1.02	9.00	198	.06	.05	.01	214.
1.01	8.10	49	.00	0.00	.00	0.	1.02	9.10	199	.06	.05	.01	214.
1.01	8.20	50	.00	0.00	.00	0.	1.02	9.20	200	.06	.05	.01	214.
1.01	8.30	51	.00	0.00	.00	0.	1.02	9.30	201	.06	.05	.01	214.
1.01	8.40	52	.00	0.00	.00	0.	1.02	9.40	202	.06	.05	.01	214.
1.01	8.50	53	.00	0.00	.00	0.	1.02	9.50	203	.06	.05	.01	214.
1.01	9.00	54	.00	0.00	.00	0.	1.02	10.00	204	.06	.05	.01	214.
1.01	9.10	55	.00	0.00	.00	0.	1.02	10.10	205	.06	.05	.01	214.
1.01	9.20	56	.00	0.00	.00	0.	1.02	10.20	206	.06	.05	.01	214.
1.01	9.30	57	.00	0.00	.00	0.	1.02	10.30	207	.06	.05	.01	214.
1.01	9.40	58	.00	0.00	.00	0.	1.02	10.40	208	.06	.05	.01	214.
1.01	9.50	59	.00	0.00	.00	0.	1.02	10.50	209	.06	.05	.01	214.
1.01	10.00	60	.00	0.00	.00	0.	1.02	11.00	210	.06	.05	.01	214.
1.01	10.10	61	.00	0.00	.00	0.	1.02	11.10	211	.06	.05	.01	214.
1.01	10.20	62	.00	0.00	.00	0.	1.02	11.20	212	.06	.05	.01	214.
1.01	10.30	63	.00	0.00	.00	0.	1.02	11.30	213	.06	.05	.01	214.
1.01	10.40	64	.00	0.00	.00	0.	1.02	11.40	214	.06	.05	.01	214.
1.01	10.50	65	.00	0.00	.00	0.	1.02	11.50	215	.06	.05	.01	214.
1.01	11.00	66	.00	0.00	.00	0.	1.02	12.00	216	.06	.05	.01	214.
1.01	11.10	67	.00	0.00	.00	0.	1.02	12.10	217	.33	.32	.01	272.

UNITED COMPUTER SYSTEMS, INC.

Sh 9

1.01	11.30	69	.00	0.00	.00	0.	1.02	12.30	219	.33	.32	.01	738.
1.01	11.40	70	.00	0.00	.00	0.	1.02	12.40	220	.33	.32	.01	976.
1.01	11.50	71	.00	0.00	.00	0.	1.02	12.50	221	.33	.32	.01	1131.
1.01	12.00	72	.00	0.00	.00	0.	1.02	13.00	222	.33	.32	.01	1219.
1.01	12.10	73	.02	0.00	.02	0.	1.02	13.10	223	.39	.38	.01	1287.
1.01	12.20	74	.02	0.00	.02	0.	1.02	13.20	224	.39	.38	.01	1367.
1.01	12.30	75	.02	0.00	.02	0.	1.02	13.30	225	.39	.38	.01	1452.
1.01	12.40	76	.02	0.00	.02	0.	1.02	13.40	226	.39	.38	.01	1521.
1.01	12.50	77	.02	0.00	.02	0.	1.02	13.50	227	.39	.38	.01	1566.
1.01	13.00	78	.02	0.00	.02	0.	1.02	14.00	228	.39	.38	.01	1591.
1.01	13.10	79	.03	0.00	.03	0.	1.02	14.10	229	.49	.48	.01	1628.
1.01	13.20	80	.03	0.00	.03	0.	1.02	14.20	230	.49	.48	.01	1709.
1.01	13.30	81	.03	0.00	.03	0.	1.02	14.30	231	.49	.48	.01	1813.
1.01	13.40	82	.03	0.00	.03	0.	1.02	14.40	232	.49	.48	.01	1903.
1.01	13.50	83	.03	0.00	.03	0.	1.02	14.50	233	.49	.48	.01	1961.
1.01	14.00	84	.03	0.00	.03	0.	1.02	15.00	234	.49	.48	.01	1994.
1.01	14.10	85	.03	0.00	.03	0.	1.02	15.10	235	.45	.44	.01	2006.
1.01	14.20	86	.03	0.00	.03	0.	1.02	15.20	236	.74	.73	.01	2050.
1.01	14.30	87	.03	0.00	.03	0.	1.02	15.30	237	1.34	1.33	.01	2359.
1.01	14.40	88	.03	0.00	.03	0.	1.02	15.40	238	3.34	3.33	.01	3494.
1.01	14.50	89	.03	0.00	.03	0.	1.02	15.50	239	.97	.96	.01	5293.
1.01	15.00	90	.03	0.00	.03	0.	1.02	16.00	240	.59	.59	.01	6195.
1.01	15.10	91	.03	0.00	.03	0.	1.02	16.10	241	.46	.45	.01	5713.
1.01	15.20	92	.05	0.00	.05	0.	1.02	16.20	242	.46	.45	.01	4524.
1.01	15.30	93	.09	0.00	.09	0.	1.02	16.30	243	.46	.45	.01	3491.
1.01	15.40	94	.23	.07	.15	16.	1.02	16.40	244	.46	.45	.01	2862.
1.01	15.50	95	.07	.06	.01	66.	1.02	16.50	245	.46	.45	.01	2474.
1.01	16.00	96	.04	.03	.01	123.	1.02	17.00	246	.46	.45	.01	2243.
1.01	16.10	97	.03	.02	.01	152.	1.02	17.10	247	.36	.35	.01	2084.
1.01	16.20	98	.03	.02	.01	147.	1.02	17.20	248	.36	.35	.01	1932.
1.01	16.30	99	.03	.02	.01	130.	1.02	17.30	249	.36	.35	.01	1785.
1.01	16.40	100	.03	.02	.01	116.	1.02	17.40	250	.36	.35	.01	1670.
1.01	16.50	101	.03	.02	.01	108.	1.02	17.50	251	.36	.35	.01	1595.
1.01	17.00	102	.03	.02	.01	103.	1.02	18.00	252	.36	.35	.01	1548.
1.01	17.10	103	.02	.02	.01	99.	1.02	18.10	253	.03	.02	.01	1448.
1.01	17.20	104	.02	.02	.01	92.	1.02	18.20	254	.03	.02	.01	1194.
1.01	17.30	105	.02	.02	.01	85.	1.02	18.30	255	.03	.02	.01	854.
1.01	17.40	106	.02	.02	.01	78.	1.02	18.40	256	.03	.02	.01	556.
1.01	17.50	107	.02	.02	.01	74.	1.02	18.50	257	.03	.02	.01	363.
1.01	18.00	108	.02	.02	.01	71.	1.02	19.00	258	.03	.02	.01	299.
1.01	18.10	109	.00	0.00	.00	66.	1.02	19.10	259	.03	.02	.01	279.
1.01	18.20	110	.00	0.00	.00	54.	1.02	19.20	260	.03	.02	.01	260.
1.01	18.30	111	.00	0.00	.00	37.	1.02	19.30	261	.03	.02	.01	243.
1.01	18.40	112	.00	0.00	.00	23.	1.02	19.40	262	.03	.02	.01	227.
1.01	18.50	113	.00	0.00	.00	13.	1.02	19.50	263	.03	.02	.01	211.
1.01	19.00	114	.00	0.00	.00	8.	1.02	20.00	264	.03	.02	.01	197.
1.01	19.10	115	.00	0.00	.00	7.	1.02	20.10	265	.03	.02	.01	184.
1.01	19.20	116	.00	0.00	.00	7.	1.02	20.20	266	.03	.02	.01	172.
1.01	19.30	117	.00	0.00	.00	6.	1.02	20.30	267	.03	.02	.01	160.
1.01	19.40	118	.00	0.00	.00	6.	1.02	20.40	268	.03	.02	.01	150.
1.01	19.50	119	.00	0.00	.00	5.	1.02	20.50	269	.03	.02	.01	139.
1.01	20.00	120	.00	0.00	.00	5.	1.02	21.00	270	.03	.02	.01	130.
1.01	20.10	121	.00	0.00	.00	5.	1.02	21.10	271	.03	.02	.01	121.
1.01	20.20	122	.00	0.00	.00	4.	1.02	21.20	272	.03	.02	.01	113.
1.01	20.30	123	.00	0.00	.00	4.	1.02	21.30	273	.03	.02	.01	106.
1.01	20.40	124	.00	0.00	.00	4.	1.02	21.40	274	.03	.02	.01	99.
1.01	20.50	125	.00	0.00	.00	4.	1.02	21.50	275	.03	.02	.01	92.
1.01	21.00	126	.00	0.00	.00	3.	1.02	22.00	276	.03	.02	.01	89.
1.01	21.10	127	.00	0.00	.00	3.	1.02	22.10	277	.03	.02	.01	89.
1.01	21.20	128	.00	0.00	.00	3.	1.02	22.20	278	.03	.02	.01	89.
1.01	21.30	129	.00	0.00	.00	3.	1.02	22.30	279	.03	.02	.01	89.
1.01	21.40	130	.00	0.00	.00	3.	1.02	22.40	280	.03	.02	.01	89.
1.01	21.50	131	.00	0.00	.00	2.	1.02	22.50	281	.03	.02	.01	89.
1.01	22.00	132	.00	0.00	.00	2.	1.02	23.00	282	.03	.02	.01	89.
1.01	22.10	133	.00	0.00	.00	2.	1.02	23.10	283	.03	.02	.01	89.

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1.01	22.30	135	.00	0.00	.00	2.	1.02	23.30	285	.03	.02	.01	89.
1.01	22.40	136	.00	0.00	.00	2.	1.02	23.40	286	.03	.02	.01	89.
1.01	22.50	137	.00	0.00	.00	2.	1.02	23.50	287	.03	.02	.01	89.
1.01	23.00	138	.00	0.00	.00	1.	1.03	0.00	288	.03	.02	.01	89.
1.01	23.10	139	.00	0.00	.00	1.	1.03	.10	289	0.00	0.00	0.00	85.
1.01	23.20	140	.00	0.00	.00	1.	1.03	.20	290	0.00	0.00	0.00	79.
1.01	23.30	141	.00	0.00	.00	1.	1.03	.30	291	0.00	0.00	0.00	74.
1.01	23.40	142	.00	0.00	.00	1.	1.03	.40	292	0.00	0.00	0.00	69.
1.01	23.50	143	.00	0.00	.00	1.	1.03	.50	293	0.00	0.00	0.00	64.
1.02	0.00	144	.00	0.00	.00	1.	1.03	1.00	294	0.00	0.00	0.00	60.
1.02	.10	145	.02	.01	.01	2.	1.03	1.10	295	0.00	0.00	0.00	56.
1.02	.20	146	.02	.01	.01	11.	1.03	1.20	296	0.00	0.00	0.00	52.
1.02	.30	147	.02	.01	.01	22.	1.03	1.30	297	0.00	0.00	0.00	49.
1.02	.40	148	.02	.01	.01	32.	1.03	1.40	298	0.00	0.00	0.00	45.
1.02	.50	149	.02	.01	.01	39.	1.03	1.50	299	0.00	0.00	0.00	42.
1.02	1.00	150	.02	.01	.01	42.	1.03	2.00	300	0.00	0.00	0.00	40.
									SUM	24.99	22.60	2.39	97931.
										(635.)	(574.)	(61.)	(2773.10)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6195.	2219.	665.	326.	97926.
CMS	175.	63.	19.	9.	2773.
INCHES		18.76	22.49	23.00	23.00
MM		476.59	571.34	584.29	584.29
AC-FT		1100.	1319.	1349.	1349.
THOUS CU M		1357.	1627.	1664.	1664.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	310.	111.	33.	16.	4896.
CMS	9.	3.	1.	0.	139.
INCHES		.94	1.12	1.15	1.15
MM		23.83	28.57	29.21	29.21
AC-FT		55.	66.	67.	67.
THOUS CU M		68.	81.	83.	83.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	620.	222.	66.	33.	9793.
CMS	18.	6.	2.	1.	277.
INCHES		1.88	2.25	2.30	2.30
MM		47.66	57.13	58.43	58.43
AC-FT		110.	132.	135.	135.
THOUS CU M		136.	163.	166.	166.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	929.	333.	100.	49.	14689.
CMS	26.	9.	3.	1.	416.
INCHES		2.81	3.37	3.45	3.45
MM		71.49	85.70	87.64	87.64
AC-FT		165.	198.	202.	202.
THOUS CU M		204.	244.	250.	250.

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HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1239.	444.	133.	85.	19585.
CMS	35.	13.	4.	2.	555.
INCHES		3.75	4.50	4.60	4.60
MM		95.32	114.27	116.86	116.86
AC-FT		220.	264.	270.	270.
THOUS CU M		271.	325.	333.	333.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 5

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1549.	555.	166.	82.	24482.
CMS	44.	16.	5.	2.	693.
INCHES		4.69	5.62	5.75	5.75
MM		119.15	142.83	146.07	146.07
AC-FT		275.	330.	337.	337.
THOUS CU M		339.	407.	416.	416.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 6

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1859.	666.	199.	98.	29378.
CMS	53.	19.	6.	3.	832.
INCHES		5.63	6.75	6.90	6.90
MM		142.98	171.40	175.29	175.29
AC-FT		330.	396.	405.	405.
THOUS CU M		407.	488.	499.	499.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 7

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3098.	1109.	332.	163.	48963.
CMS	88.	31.	9.	5.	1386.
INCHES		9.38	11.25	11.50	11.50
MM		238.30	285.67	292.15	292.15
AC-FT		550.	659.	674.	674.
THOUS CU M		679.	813.	832.	832.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 8

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4646.	1664.	499.	245.	73445.
CMS	132.	47.	14.	7.	2080.
INCHES		14.07	16.87	17.25	17.25
MM		357.44	428.50	438.22	438.22
AC-FT		825.	989.	1012.	1012.
THOUS CU M		1018.	1220.	1248.	1248.

Sh 12

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 9

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6195.	2219.	665.	326.	97926.
CMS	175.	63.	19.	9.	2773.
INCHES		18.76	22.49	23.00	23.00
MM		476.59	571.34	584.29	584.29
AC-FT		1100.	1319.	1349.	1349.
THOUS CU M		1357.	1627.	1664.	1664.

HYDROGRAPH ROUTING

OUTFLOW FROM BEARFORT WATERS

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
OUTFLO		1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

	NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
	1	0	0	0.000	0.000	0.000	-1130.	-1

STAGE	1130.00	1131.00	1132.00	1132.50	1133.00	1135.00	1140.00	1145.00
FLOW	0.00	16.00	45.00	59.00	269.00	2784.00	19862.00	54081.00
SURFACE AREA=	0.	28.	134.	257.				
CAPACITY=	0.	93.	2326.	6170.				
ELEVATION=	1120.	1130.	1160.	1180.				

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1130.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1132.5	0.0	0.0	0.

STATION OUTFLO, PLAN 1, RATIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	37.	34.	15.	7.	2179.
CMS	1.	1.	0.	0.	62.
INCHES		.29	.50	.51	.51
MM		7.31	12.81	13.00	13.00
AC-FT		17.	30.	30.	30.
THOUS CU M		21.	36.	37.	37.

STATION OUTFLO, PLAN 1, RATIO 2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	187.	107.	39.	19.	5678.
CMS	5.	3.	1.	1.	161.
INCHES		.91	1.32	1.33	1.33
MM		23.00	33.51	33.88	33.88
AC-FT		53.	77.	78.	78.
THOUS CU M		65.	95.	96.	96.

STATION OUTFLO, PLAN 1, RATIO 3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	596.	225.	71.	35.	10359.
CMS	17.	6.	2.	1.	293.
INCHES		1.90	2.41	2.43	2.43
MM		48.29	61.25	61.81	61.81
AC-FT		111.	141.	143.	143.
THOUS CU M		138.	174.	176.	176.

STATION OUTFLO, PLAN 1, RATIO 4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	965.	346.	104.	50.	15091.
CMS	27.	10.	3.	1.	427.
INCHES		2.93	3.52	3.55	3.55
MM		74.39	89.30	90.04	90.04
AC-FT		172.	206.	208.	208.
THOUS CU M		212.	254.	256.	256.

Sh 13

UNITED COMPUTING SYSTEMS, INC.

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                                   STATION OUTFLO, PLAN 1, RATIO 5

                         PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
              CFS        1233.     468.      137.       66.        19848.
              CMS          35.      13.        4.        2.          562.
           INCHES                  3.96      4.63      4.66         4.66
               MM                100.50    117.50    118.42       118.42
            AC-FT                  232.      271.      273.          273.
       THOUS CU M                  286.      335.      337.          337.

                                   STATION OUTFLO, PLAN 1, RATIO 6

                         PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
              CFS        1481.     587.      170.       82.        24618.
              CMS          42.      17.        5.        2.          697.
           INCHES                  4.97      5.74      5.78         5.78
               MM                126.17    145.78    146.89       146.89
            AC-FT                  291.      337.      339.          339.
       THOUS CU M                  359.      415.      418.          418.

                                   STATION OUTFLO, PLAN 1, RATIO 7 (½ PMF)

                                  END-OF-PERIOD HYDROGRAPH ORDINATES

                                              OUTFLOW
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        1.        1.        2.        2.        3.
          3.        3.        4.        4.        4.        5.        5.        5.        5.        6.
          6.        6.        6.        6.        6.        6.        6.        6.        6.        6.
          6.        6.        6.        6.        6.        6.        6.        6.        6.        5.
          5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
          5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
          5.        6.        6.        6.        6.        6.        6.        6.        6.        7.
          7.        7.        7.        7.        7.        7.        7.        8.        8.        8.
          8.        8.        8.        8.        8.        9.        9.        9.        9.        9.
          9.        9.       10.       10.       11.       11.       12.       13.       13.       14.
         15.       15.       16.       17.       18.       19.       21.       22.       23.       24.
         25.       26.       27.       28.       29.       30.       31.       32.       33.       34.
         35.       36.       37.       37.       38.       39.       40.       42.       45.       50.
         55.       89.      173.      248.      396.      532.      626.      689.      734.      773.
        814.      859.      900.      934.      960.      980.     1027.     1193.     1572.     2053.
       2389.     2450.     2289.     2034.     1776.     1554.     1376.     1236.     1119.     1022.
        943.      882.      831.      765.      667.      544.      421.      320.      262.      243.
        225.      209.      194.      180.      167.      155.      144.      134.      124.      116.
        107.      100.       93.       86.       80.       75.       70.       66.       63.       60.
         59.       59.       59.       58.       58.       58.       58.       58.       58.       58.
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Sh 14

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                                                    STORAGE
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
       93.        93.        93.        93.        94.        94.        95.        96.        97.        98.
       99.        99.       100.       101.       101.       102.       102.       103.       103.       103.
      104.       104.       104.       104.       104.       104.       104.       104.       104.       104.
      104.       103.       103.       103.       103.       103.       103.       103.       103.       103.
      103.       103.       103.       103.       103.       103.       103.       103.       103.       102.
      102.       102.       102.       102.       102.       102.       102.       102.       102.       103.
      103.       103.       103.       104.       104.       104.       104.       105.       105.       105.
      105.       106.       106.       106.       106.       106.       107.       107.       107.       107.
      108.       108.       108.       108.       108.       109.       109.       109.       109.       109.
      110.       110.       111.       111.       113.       114.       115.       116.       117.       119.
      120.       121.       122.       124.       125.       126.       127.       128.       130.       131.
      132.       133.       134.       135.       136.       137.       138.       140.       141.       142.
      143.       144.       145.       145.       146.       147.       148.       150.       154.       159.
      166.       173.       180.       186.       191.       195.       198.       200.       201.       202.
      203.       204.       206.       207.       207.       208.       209.       214.       225.       240.
      250.       252.       247.       239.       232.       225.       220.       215.       212.       209.
      207.       205.       204.       202.       199.       195.       192.       189.       187.       186.
      184.       183.       181.       180.       179.       178.       177.       177.       176.       175.
      174.       174.       173.       173.       172.       172.       171.       171.       171.       171.
      170.       170.       170.       170.       170.       169.       169.       169.       169.       169.
      168.       168.       168.       167.       167.       167.       166.       166.       165.       165.

                                                     STAGE
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1131.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
    1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.1     1130.1     1130.1     1130.2
    1130.2     1130.2     1130.2     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.4
    1130.4     1130.4     1130.4     1130.4     1130.4     1130.4     1130.4     1130.4     1130.4     1130.4
    1130.4     1130.4     1130.4     1130.4     1130.4     1130.4     1130.3     1130.3     1130.3     1130.3
    1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3
    1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.3
    1130.3     1130.3     1130.4     1130.4     1130.4     1130.4     1130.4     1130.4     1130.4     1130.4
    1130.4     1130.4     1130.4     1130.4     1130.5     1130.5     1130.5     1130.5     1130.5     1130.5
    1130.5     1130.5     1130.5     1130.5     1130.5     1130.5     1130.5     1130.5     1130.6     1130.6
    1130.6     1130.6     1130.6     1130.6     1130.7     1130.7     1130.7     1130.8     1130.8     1130.9
    1130.9     1131.0     1131.0     1131.0     1131.1     1131.1     1131.2     1131.2     1131.2     1131.3
    1131.3     1131.3     1131.4     1131.4     1131.5     1131.5     1131.5     1131.6     1131.6     1131.6
    1131.6     1131.7     1131.7     1131.7     1131.8     1131.8     1131.8     1131.9     1132.0     1132.2
    1132.4     1132.6     1132.8     1133.0     1133.1     1133.2     1133.3     1133.3     1133.4     1133.4
    1133.4     1133.5     1133.5     1133.5     1133.5     1133.6     1133.6     1133.7     1134.0     1134.4
    1134.7     1134.7     1134.6     1134.4     1134.2     1134.0     1133.9     1133.8     1133.7     1133.6
    1133.5     1133.5     1133.4     1133.4     1133.3     1133.2     1133.1     1133.0     1133.0     1132.9
    1132.9     1132.9     1132.8     1132.8     1132.8     1132.7     1132.7     1132.7     1132.7     1132.6
    1132.6     1132.6     1132.6     1132.6     1132.6     1132.5     1132.5     1132.5     1132.5     1132.5
    1132.5     1132.5     1132.5     1132.5     1132.5     1132.5     1132.5     1132.5     1132.5     1132.4
    1132.4     1132.4     1132.4     1132.4     1132.4     1132.4     1132.4     1132.4     1132.3     1132.3

 PEAK OUTFLOW IS     2450. AT TIME  40.33 HOURS

                                 PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                         CFS    2450.    1060.     302.      146.        43786.
                         CMS      69.      30.       9.        4.         1240.
                      INCHES              8.97     10.21     10.29        10.29
                          MM            227.74    259.41    261.25       261.25
                       AC-FT              526.      599.      603.         603.
                  THOUS CU M              648.      739.      744.         744.
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Sh 15

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                                                  STORAGE
      93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
      93.       94.       94.       94.       94.       94.       94.       94.       94.       94.
      94.       94.       94.       94.       94.       94.       94.       94.       94.       94.
      94.       94.       94.       94.       94.       94.       94.       94.       94.       94.
      94.       94.       94.       94.       94.       94.       94.       94.       94.       94.
      94.       94.       94.       94.       94.       94.       94.       94.       94.       94.
      94.       94.       94.       94.       94.       94.       94.       94.       94.       94.
      94.       94.       94.       94.       94.       94.       94.       94.       94.       94.
      94.       94.       94.       94.       94.       94.       94.       94.       94.       94.
      94.       94.       94.       94.       94.       95.       97.       99.      101.      103.
     104.      106.      107.      108.      109.      110.      111.      112.      113.      113.
     114.      114.      114.      114.      114.      114.      114.      114.      114.      114.
     114.      114.      114.      113.      113.      113.      113.      113.      113.      113.
     113.      113.      112.      112.      112.      112.      112.      112.      112.      112.
     112.      111.      111.      111.      111.      111.      111.      111.      112.      112.
     113.      113.      113.      114.      114.      115.      115.      116.      116.      117.
     117.      118.      118.      119.      119.      120.      120.      121.      121.      121.
     122.      122.      123.      123.      124.      124.      124.      125.      125.      126.
     126.      127.      128.      130.      132.      134.      136.      139.      141.      144.
     146.      148.      151.      153.      155.      158.      160.      162.      164.      167.
     169.      171.      173.      174.      176.      177.      178.      179.      179.      180.
     180.      181.      181.      181.      182.      182.      182.      185.      189.      195.
     201.      206.      210.      213.      216.      218.      221.      223.      224.      226.
     228.      230.      232.      234.      236.      237.      240.      250.      270.      291.
     298.      293.      282.      271.      264.      258.      253.      248.      243.      238.
     234.      231.      228.      224.      219.      211.      204.      198.      194.      192.
     190.      189.      188.      187.      186.      185.      184.      183.      182.      182.
     181.      180.      179.      178.      178.      177.      176.      176.      175.      175.
     175.      174.      174.      174.      174.      174.      174.      173.      173.      173.
     173.      173.      173.      172.      172.      172.      171.      171.      171.      171.

                                                   STAGE
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
    1130.0    1130.0    1130.0    1130.0    1130.0    1130.1    1130.1    1130.2    1130.3    1130.3
    1130.4    1130.4    1130.5    1130.5    1130.6    1130.6    1130.6    1130.7    1130.7    1130.7
    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7
    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7
    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.6    1130.6    1130.6    1130.6
    1130.6    1130.6    1130.6    1130.6    1130.6    1130.6    1130.6    1130.6    1130.6    1130.7
    1130.7    1130.7    1130.7    1130.7    1130.7    1130.7    1130.8    1130.8    1130.8    1130.8
    1130.8    1130.8    1130.9    1130.9    1130.9    1130.9    1130.9    1130.9    1131.0    1131.0
    1131.0    1131.0    1131.0    1131.0    1131.0    1131.1    1131.1    1131.1    1131.1    1131.1
    1131.1    1131.1    1131.2    1131.2    1131.3    1131.4    1131.4    1131.5    1131.6    1131.7
    1131.8    1131.8    1131.9    1132.0    1132.0    1132.1    1132.2    1132.3    1132.3    1132.4
    1132.4    1132.5    1132.6    1132.6    1132.7    1132.7    1132.7    1132.7    1132.8    1132.8
    1132.8    1132.8    1132.8    1132.8    1132.8    1132.8    1132.9    1132.9    1133.0    1133.2
    1133.4    1133.5    1133.6    1133.7    1133.8    1133.9    1133.9    1134.0    1134.0    1134.0
    1134.1    1134.2    1134.2    1134.3    1134.3    1134.3    1134.4    1134.7    1135.2    1135.7
    1135.9    1135.7    1135.5    1135.2    1135.0    1134.9    1134.8    1134.6    1134.5    1134.4
    1134.3    1134.2    1134.1    1134.0    1133.9    1133.7    1133.5    1133.3    1133.2    1133.1
    1133.1    1133.0    1133.0    1133.0    1133.0    1132.9    1132.9    1132.9    1132.8    1132.8
    1132.8    1132.8    1132.8    1132.7    1132.7    1132.7    1132.7    1132.7    1132.6    1132.6
    1132.6    1132.6    1132.6    1132.6    1132.6    1132.6    1132.6    1132.6    1132.6    1132.6
    1132.6    1132.6    1132.6    1132.6    1132.5    1132.5    1132.5    1132.5    1132.5    1132.5

PEAK OUTFLOW IS     5712. AT TIME  40.17 HOURS

                         PEAK    6-HOUR   24-HOUR   72-HOUR    TOTAL VOLUME
                CFS      5712.    2191.     637.      308.         92322.
                CMS       162.      62.      18.        9.          2614.
             INCHES               18.53     21.54     21.69         21.69
                 MM              470.61    547.20    550.85        550.85
              AC-FT               1086.     1263.     1272.         1272.
         THOUS CU M               1340.     1558.     1569.         1569.
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                              STATION OUTFLO, PLAN 1, RATIO 8

                              END-OF-PERIOD HYDROGRAPH ORDINATES

                    PEAK   6-HOUR  24-HOUR  72-HOUR  TOTAL VOLUME
          CFS      4155.    1638.     469.     227.      67972.
          CMS       118.      46.      13.       6.       1925.
       INCHES              13.85    15.86    15.97       15.97
           MM             351.84   402.81   405.56      405.56
        AC-FT                812.     930.     936.        936.
   THOUS CU M               1002.    1147.    1155.       1155.


                              STATION OUTFLO, PLAN 1, RATIO 9 (PMF)

                              END-OF-PERIOD HYDROGRAPH ORDINATES

                                   OUTFLOW
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
     0.      0.      0.      0.      0.      1.      2.      3.      4.      5.
     6.      7.      8.      8.      9.      9.     10.     10.     11.     11.
    11.     12.     12.     12.     12.     12.     12.     11.     11.     11.
    11.     11.     11.     11.     11.     11.     11.     11.     11.     11.
    11.     11.     11.     11.     11.     10.     10.     10.     10.     10.
    10.     10.     10.     10.     10.     10.     10.     10.     10.     10.
    11.     11.     11.     11.     12.     12.     12.     13.     13.     13.
    13.     14.     14.     14.     14.     15.     15.     15.     15.     15.
    16.     16.     16.     17.     17.     18.     18.     18.     19.     19.
    20.     20.     21.     23.     25.     27.     29.     31.     33.     36.
    38.     40.     42.     44.     46.     48.     50.     52.     54.     56.
    58.     64.     88.    107.    124.    138.    149.    159.    168.    175.
   181.    188.    190.    194.    197.    200.    206.    231.    318.    530.
   734.    905.   1038.   1149.   1248.   1338.   1415.   1477.   1526.   1580.
  1647.   1725.   1802.   1866.   1915.   1956.   2047.   2367.   3417.   5105.
  5712.   5288.   4366.   3500.   2889.   2646.   2473.   2305.   2143.   1991.
  1859.   1752.   1658.   1532.   1341.   1100.    854.    651.    510.    416.
   351.    305.    271.    260.    250.    239.    228.    217.    206.    195.
   185.    175.    165.    155.    146.    138.    130.    124.    119.    114.
   110.    107.    104.    102.    100.     98.     97.     96.     94.     93.
    90.     87.     84.     81.     77.     74.     70.     66.     63.     59.
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SUB-AREA RUNOFF COMPUTATION

INFLOW TO LOOKOVER LAKE

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
INFLOW		0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	.30	0.00	1.40	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.00	111.00	123.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TC= 0.00 LAG= .44

RECESSION DATA

STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH IS END OF PERIOD ORDINATES. TC= 0.00 HOURS. LAG= .44 VOL= 1.00

59. 200. 276. 244. 158. 90. 55. 33. 19. 11.
7. 4. 3. 2. 1.

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.10	1	.00	0.00	.00	0.	1.02	1.10	151	.02	.01	.01	12.
1.01	.20	2	.00	0.00	.00	0.	1.02	1.20	152	.02	.01	.01	13.
1.01	.30	3	.00	0.00	.00	0.	1.02	1.30	153	.02	.01	.01	13.
1.01	.40	4	.00	0.00	.00	0.	1.02	1.40	154	.02	.01	.01	13.
1.01	.50	5	.00	0.00	.00	0.	1.02	1.50	155	.02	.01	.01	13.
1.01	1.00	6	.00	0.00	.00	0.	1.02	2.00	156	.02	.01	.01	13.
1.01	1.10	7	.00	0.00	.00	0.	1.02	2.10	157	.02	.01	.01	13.
1.01	1.20	8	.00	0.00	.00	0.	1.02	2.20	158	.02	.01	.01	13.
1.01	1.30	9	.00	0.00	.00	0.	1.02	2.30	159	.02	.01	.01	13.
1.01	1.40	10	.00	0.00	.00	0.	1.02	2.40	160	.02	.01	.01	13.
1.01	1.50	11	.00	0.00	.00	0.	1.02	2.50	161	.02	.01	.01	13.
1.01	2.00	12	.00	0.00	.00	0.	1.02	3.00	162	.02	.01	.01	13.
1.01	2.10	13	.00	0.00	.00	0.	1.02	3.10	163	.02	.01	.01	13.
1.01	2.20	14	.00	0.00	.00	0.	1.02	3.20	164	.02	.01	.01	13.
1.01	2.30	15	.00	0.00	.00	0.	1.02	3.30	165	.02	.01	.01	13.
1.01	2.40	16	.00	0.00	.00	0.	1.02	3.40	166	.02	.01	.01	13.
1.01	2.50	17	.00	0.00	.00	0.	1.02	3.50	167	.02	.01	.01	13.
1.01	3.00	18	.00	0.00	.00	0.	1.02	4.00	168	.02	.01	.01	13.
1.01	3.10	19	.00	0.00	.00	0.	1.02	4.10	169	.02	.01	.01	13.
1.01	3.20	20	.00	0.00	.00	0.	1.02	4.20	170	.02	.01	.01	13.
1.01	3.30	21	.00	0.00	.00	0.	1.02	4.30	171	.02	.01	.01	13.
1.01	3.40	22	.00	0.00	.00	0.	1.02	4.40	172	.02	.01	.01	13.
1.01	3.50	23	.00	0.00	.00	0.	1.02	4.50	173	.02	.01	.01	13.
1.01	4.00	24	.00	0.00	.00	0.	1.02	5.00	174	.02	.01	.01	13.
1.01	4.10	25	.00	0.00	.00	0.	1.02	5.10	175	.02	.01	.01	13.
1.01	4.20	26	.00	0.00	.00	0.	1.02	5.20	176	.02	.01	.01	13.
1.01	4.30	27	.00	0.00	.00	0.	1.02	5.30	177	.02	.01	.01	15.
1.01	4.40	28	.00	0.00	.00	0.	1.02	5.40	178	.02	.01	.01	15.

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1.01	4.50	29	.00	0.00	.00	0.	1.02	5.50	179	.02	.01	.01	13.
1.01	5.00	30	.00	0.00	.00	0.	1.02	6.00	180	.02	.01	.01	13.
1.01	5.10	31	.00	0.00	.00	0.	1.02	6.10	181	.06	.05	.01	15.
1.01	5.20	32	.00	0.00	.00	0.	1.02	6.20	182	.06	.05	.01	23.
1.01	5.30	33	.00	0.00	.00	0.	1.02	6.30	183	.06	.05	.01	34.
1.01	5.40	34	.00	0.00	.00	0.	1.02	6.40	184	.06	.05	.01	43.
1.01	5.50	35	.00	0.00	.00	0.	1.02	6.50	185	.06	.05	.01	50.
1.01	6.00	36	.00	0.00	.00	0.	1.02	7.00	186	.06	.05	.01	53.
1.01	6.10	37	.00	0.00	.00	0.	1.02	7.10	187	.06	.05	.01	55.
1.01	6.20	38	.00	0.00	.00	0.	1.02	7.20	188	.06	.05	.01	57.
1.01	6.30	39	.00	0.00	.00	0.	1.02	7.30	189	.06	.05	.01	57.
1.01	6.40	40	.00	0.00	.00	0.	1.02	7.40	190	.06	.05	.01	58.
1.01	6.50	41	.00	0.00	.00	0.	1.02	7.50	191	.06	.05	.01	58.
1.01	7.00	42	.00	0.00	.00	0.	1.02	8.00	192	.06	.05	.01	58.
1.01	7.10	43	.00	0.00	.00	0.	1.02	8.10	193	.06	.05	.01	58.
1.01	7.20	44	.00	0.00	.00	0.	1.02	8.20	194	.06	.05	.01	58.
1.01	7.30	45	.00	0.00	.00	0.	1.02	8.30	195	.06	.05	.01	58.
1.01	7.40	46	.00	0.00	.00	0.	1.02	8.40	196	.06	.05	.01	58.
1.01	7.50	47	.00	0.00	.00	0.	1.02	8.50	197	.06	.05	.01	58.
1.01	8.00	48	.00	0.00	.00	0.	1.02	9.00	198	.06	.05	.01	58.
1.01	8.10	49	.00	0.00	.00	0.	1.02	9.10	199	.06	.05	.01	58.
1.01	8.20	50	.00	0.00	.00	0.	1.02	9.20	200	.06	.05	.01	58.
1.01	8.30	51	.00	0.00	.00	0.	1.02	9.30	201	.06	.05	.01	58.
1.01	8.40	52	.00	0.00	.00	0.	1.02	9.40	202	.06	.05	.01	58.
1.01	8.50	53	.00	0.00	.00	0.	1.02	9.50	203	.06	.05	.01	58.
1.01	9.00	54	.00	0.00	.00	0.	1.02	10.00	204	.06	.05	.01	58.
1.01	9.10	55	.00	0.00	.00	0.	1.02	10.10	205	.06	.05	.01	58.
1.01	9.20	56	.00	0.00	.00	0.	1.02	10.20	206	.06	.05	.01	58.
1.01	9.30	57	.00	0.00	.00	0.	1.02	10.30	207	.06	.05	.01	58.
1.01	9.40	58	.00	0.00	.00	0.	1.02	10.40	208	.06	.05	.01	58.
1.01	9.50	59	.00	0.00	.00	0.	1.02	10.50	209	.06	.05	.01	58.
1.01	10.00	60	.00	0.00	.00	0.	1.02	11.00	210	.06	.05	.01	58.
1.01	10.10	61	.00	0.00	.00	0.	1.02	11.10	211	.06	.05	.01	58.
1.01	10.20	62	.00	0.00	.00	0.	1.02	11.20	212	.06	.05	.01	58.
1.01	10.30	63	.00	0.00	.00	0.	1.02	11.30	213	.06	.05	.01	58.
1.01	10.40	64	.00	0.00	.00	0.	1.02	11.40	214	.06	.05	.01	58.
1.01	10.50	65	.00	0.00	.00	0.	1.02	11.50	215	.06	.05	.01	58.
1.01	11.00	66	.00	0.00	.00	0.	1.02	12.00	216	.06	.05	.01	58.
1.01	11.10	67	.00	0.00	.00	0.	1.02	12.10	217	.33	.32	.01	74.
1.01	11.20	68	.00	0.00	.00	0.	1.02	12.20	218	.33	.32	.01	127.
1.01	11.30	69	.00	0.00	.00	0.	1.02	12.30	219	.33	.32	.01	201.
1.01	11.40	70	.00	0.00	.00	0.	1.02	12.40	220	.33	.32	.01	266.
1.01	11.50	71	.00	0.00	.00	0.	1.02	12.50	221	.33	.32	.01	308.
1.01	12.00	72	.00	0.00	.00	0.	1.02	13.00	222	.33	.32	.01	333.
1.01	12.10	73	.02	0.00	.02	0.	1.02	13.10	223	.39	.38	.01	351.
1.01	12.20	74	.02	0.00	.02	0.	1.02	13.20	224	.39	.38	.01	373.
1.01	12.30	75	.02	0.00	.02	0.	1.02	13.30	225	.39	.38	.01	396.
1.01	12.40	76	.02	0.00	.02	0.	1.02	13.40	226	.39	.38	.01	415.
1.01	12.50	77	.02	0.00	.02	0.	1.02	13.50	227	.39	.38	.01	427.
1.01	13.00	78	.02	0.00	.02	0.	1.02	14.00	228	.39	.38	.01	434.
1.01	13.10	79	.03	0.00	.03	0.	1.02	14.10	229	.49	.48	.01	444.
1.01	13.20	80	.03	0.00	.03	0.	1.02	14.20	230	.49	.48	.01	466.
1.01	13.30	81	.03	0.00	.03	0.	1.02	14.30	231	.49	.48	.01	494.
1.01	13.40	82	.03	0.00	.03	0.	1.02	14.40	232	.49	.48	.01	519.
1.01	13.50	83	.03	0.00	.03	0.	1.02	14.50	233	.49	.48	.01	535.
1.01	14.00	84	.03	0.00	.03	0.	1.02	15.00	234	.49	.48	.01	544.
1.01	14.10	85	.03	0.00	.03	0.	1.02	15.10	235	.45	.44	.01	547.
1.01	14.20	86	.03	0.00	.03	0.	1.02	15.20	236	.74	.73	.01	559.
1.01	14.30	87	.03	0.00	.03	0.	1.02	15.30	237	1.34	1.33	.01	643.
1.01	14.40	88	.03	0.00	.03	0.	1.02	15.40	238	3.34	3.33	.01	953.
1.01	14.50	89	.03	0.00	.03	0.	1.02	15.50	239	.97	.96	.01	1443.
1.01	15.00	90	.03	0.00	.03	0.	1.02	16.00	240	.59	.59	.01	1690.
1.01	15.10	91	.03	0.00	.03	0.	1.02	16.10	241	.46	.45	.01	1558.
1.01	15.20	92	.05	0.00	.05	0.	1.02	16.20	242	.46	.45	.01	1234.
1.01	15.30	93	.09	0.00	.09	0.	1.02	16.30	243	.46	.45	.01	991.
[illegible]													

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1.01	15.50	95	.07	.06	.01	18.	1.02	16.50	245	.46	.45	.01	675.
1.01	16.00	96	.04	.03	.01	34.	1.02	17.00	246	.46	.45	.01	612.
1.01	16.10	97	.03	.02	.01	41.	1.02	17.10	247	.36	.35	.01	568.
1.01	16.20	98	.03	.02	.01	40.	1.02	17.20	248	.36	.35	.01	527.
1.01	16.30	99	.03	.02	.01	35.	1.02	17.30	249	.36	.35	.01	487.
1.01	16.40	100	.03	.02	.01	32.	1.02	17.40	250	.36	.35	.01	455.
1.01	16.50	101	.03	.02	.01	30.	1.02	17.50	251	.36	.35	.01	435.
1.01	17.00	102	.03	.02	.01	28.	1.02	18.00	252	.36	.35	.01	422.
1.01	17.10	103	.02	.02	.01	27.	1.02	18.10	253	.03	.02	.01	395.
1.01	17.20	104	.02	.02	.01	25.	1.02	18.20	254	.03	.02	.01	326.
1.01	17.30	105	.02	.02	.01	23.	1.02	18.30	255	.03	.02	.01	233.
1.01	17.40	106	.02	.02	.01	21.	1.02	18.40	256	.03	.02	.01	152.
1.01	17.50	107	.02	.02	.01	20.	1.02	18.50	257	.03	.02	.01	99.
1.01	18.00	108	.02	.02	.01	19.	1.02	19.00	258	.03	.02	.01	82.
1.01	18.10	109	.00	0.00	.00	18.	1.02	19.10	259	.03	.02	.01	76.
1.01	18.20	110	.00	0.00	.00	15.	1.02	19.20	260	.03	.02	.01	71.
1.01	18.30	111	.00	0.00	.00	10.	1.02	19.30	261	.03	.02	.01	66.
1.01	18.40	112	.00	0.00	.00	6.	1.02	19.40	262	.03	.02	.01	62.
1.01	18.50	113	.00	0.00	.00	4.	1.02	19.50	263	.03	.02	.01	58.
1.01	19.00	114	.00	0.00	.00	2.	1.02	20.00	264	.03	.02	.01	54.
1.01	19.10	115	.00	0.00	.00	2.	1.02	20.10	265	.03	.02	.01	50.
1.01	19.20	116	.00	0.00	.00	2.	1.02	20.20	266	.03	.02	.01	47.
1.01	19.30	117	.00	0.00	.00	2.	1.02	20.30	267	.03	.02	.01	44.
1.01	19.40	118	.00	0.00	.00	2.	1.02	20.40	268	.03	.02	.01	41.
1.01	19.50	119	.00	0.00	.00	1.	1.02	20.50	269	.03	.02	.01	38.
1.01	20.00	120	.00	0.00	.00	1.	1.02	21.00	270	.03	.02	.01	35.
1.01	20.10	121	.00	0.00	.00	1.	1.02	21.10	271	.03	.02	.01	33.
1.01	20.20	122	.00	0.00	.00	1.	1.02	21.20	272	.03	.02	.01	31.
1.01	20.30	123	.00	0.00	.00	1.	1.02	21.30	273	.03	.02	.01	29.
1.01	20.40	124	.00	0.00	.00	1.	1.02	21.40	274	.03	.02	.01	27.
1.01	20.50	125	.00	0.00	.00	1.	1.02	21.50	275	.03	.02	.01	25.
1.01	21.00	126	.00	0.00	.00	1.	1.02	22.00	276	.03	.02	.01	24.
1.01	21.10	127	.00	0.00	.00	1.	1.02	22.10	277	.03	.02	.01	24.
1.01	21.20	128	.00	0.00	.00	1.	1.02	22.20	278	.03	.02	.01	24.
1.01	21.30	129	.00	0.00	.00	1.	1.02	22.30	279	.03	.02	.01	24.
1.01	21.40	130	.00	0.00	.00	1.	1.02	22.40	280	.03	.02	.01	24.
1.01	21.50	131	.00	0.00	.00	1.	1.02	22.50	281	.03	.02	.01	24.
1.01	22.00	132	.00	0.00	.00	1.	1.02	23.00	282	.03	.02	.01	24.
1.01	22.10	133	.00	0.00	.00	1.	1.02	23.10	283	.03	.02	.01	24.
1.01	22.20	134	.00	0.00	.00	1.	1.02	23.20	284	.03	.02	.01	24.
1.01	22.30	135	.00	0.00	.00	0.	1.02	23.30	285	.03	.02	.01	24.
1.01	22.40	136	.00	0.00	.00	0.	1.02	23.40	286	.03	.02	.01	24.
1.01	22.50	137	.00	0.00	.00	0.	1.02	23.50	287	.03	.02	.01	24.
1.01	23.00	138	.00	0.00	.00	0.	1.03	0.00	288	.03	.02	.01	24.
1.01	23.10	139	.00	0.00	.00	0.	1.03	.10	289	0.00	0.00	0.00	23.
1.01	23.20	140	.00	0.00	.00	0.	1.03	.20	290	0.00	0.00	0.00	22.
1.01	23.30	141	.00	0.00	.00	0.	1.03	.30	291	0.00	0.00	0.00	20.
1.01	23.40	142	.00	0.00	.00	0.	1.03	.40	292	0.00	0.00	0.00	19.
1.01	23.50	143	.00	0.00	.00	0.	1.03	.50	293	0.00	0.00	0.00	18.
1.02	0.00	144	.00	0.00	.00	0.	1.03	1.00	294	0.00	0.00	0.00	16.
1.02	.10	145	.02	.01	.01	1.	1.03	1.10	295	0.00	0.00	0.00	15.
1.02	.20	146	.02	.01	.01	3.	1.03	1.20	296	0.00	0.00	0.00	14.
1.02	.30	147	.02	.01	.01	6.	1.03	1.30	297	0.00	0.00	0.00	13.
1.02	.40	148	.02	.01	.01	9.	1.03	1.40	298	0.00	0.00	0.00	12.
1.02	.50	149	.02	.01	.01	11.	1.03	1.50	299	0.00	0.00	0.00	12.
1.02	1.00	150	.02	.01	.01	12.	1.03	2.00	300	0.00	0.00	0.00	11.
									SUM	24.99	22.60	2.39	26689.
										(635.)	(574.)	(61.)	(755.75)

Sh 20

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1690.	605.	181.	89.	26707.
CMS	48.	17.	5.	3.	756.
INCHES		18.76	22.49	23.00	23.00
MM		476.59	571.34	584.29	584.29
AC-FT		300.	360.	368.	368.
THOUS CU M		370.	444.	454.	454.

UNITED COMPUTING SYSTEMS, INC.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	84.	30.	9.	4.	1335.
CMS	2.	1.	0.	0.	38.
INCHES		.94	1.12	1.15	1.15
MM		23.83	28.57	29.21	29.21
AC-FT		15.	18.	18.	18.
THOUS CU M		19.	22.	23.	23.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	169.	61.	18.	9.	2671.
CMS	5.	2.	1.	0.	76.
INCHES		1.88	2.25	2.30	2.30
MM		47.66	57.13	58.43	58.43
AC-FT		30.	36.	37.	37.
THOUS CU M		37.	44.	45.	45.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	253.	91.	27.	13.	4006.
CMS	7.	3.	1.	0.	113.
INCHES		2.81	3.37	3.45	3.45
MM		71.49	85.70	87.64	87.64
AC-FT		45.	54.	55.	55.
THOUS CU M		56.	67.	68.	68.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	338.	121.	36.	18.	5341.
CMS	10.	3.	1.	1.	151.
INCHES		3.75	4.50	4.60	4.60
MM		95.32	114.27	116.85	116.86
AC-FT		60.	72.	74.	74.
THOUS CU M		74.	89.	91.	91.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 5

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	422.	151.	45.	22.	6677.
CMS	12.	4.	1.	1.	189.
INCHES		4.69	5.62	5.75	5.75
MM		119.15	142.83	146.07	146.07
AC-FT		75.	90.	92.	92.
THOUS CU M		93.	111.	113.	113.

Sh 21

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 6 — UNITED COMPUTING SYSTEMS, INC.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	507.	182.	54.	27.	8012.
CMS	14.	5.	2.	1.	227.
INCHES		5.63	6.75	6.90	6.90
MM		142.98	171.40	175.29	175.29
AC-FT		90.	108.	110.	110.
THOUS CU M		111.	133.	136.	136.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 7

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	845.	303.	91.	45.	13354.
CMS	24.	9.	3.	1.	378.
INCHES		9.38	11.25	11.50	11.50
MM		238.30	285.67	292.15	292.15
AC-FT		150.	180.	184.	184.
THOUS CU M		185.	222.	227.	227.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 8

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1267.	454.	136.	67.	20030.
CMS	36.	13.	4.	2.	567.
INCHES		14.07	16.87	17.25	17.25
MM		357.44	428.50	438.22	438.22
AC-FT		225.	270.	276.	276.
THOUS CU M		278.	333.	340.	340.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 9

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1690.	605.	181.	89.	26707.
CMS	48.	17.	5.	3.	756.
INCHES		18.76	22.49	23.00	23.00
MM		476.59	571.34	584.29	584.29
AC-FT		300.	360.	368.	368.
THOUS CU M		370.	444.	454.	454.

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COMBINE HYDROGRAPHS

COMBINE INFLOW AND BEARFORT WATERS OUTFLOW

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
COMBIN	2	0	0	0	0	1	0	0

Sh 22

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	104.	54.	24.	12.	3514.
CMS	3.	2.	1.	0.	100.
INCHES		.36	.64	.65	.65
MM		9.07	16.19	16.47	16.47
AC-FT		27.	48.	48.	48.
THOUS CU M		33.	59.	60.	60.

UNITED COMPUTING SYSTEMS, INC.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	241.	152.	57.	28.	8348.
CMS	7.	4.	2.	1.	236.
INCHES		1.01	1.52	1.54	1.54
MM		25.58	38.57	39.14	39.14
AC-FT		75.	113.	115.	115.
THOUS CU M		93.	140.	142.	142.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	778.	300.	98.	48.	14366.
CMS	22.	8.	3.	1.	407.
INCHES		1.99	2.62	2.65	2.65
MM		50.62	66.49	67.35	67.35
AC-FT		149.	195.	198.	198.
THOUS CU M		183.	241.	244.	244.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1240.	450.	140.	68.	20433.
CMS	35.	13.	4.	2.	579.
INCHES		2.99	3.73	3.77	3.77
MM		75.88	94.65	95.79	95.79
AC-FT		223.	278.	281.	281.
THOUS CU M		275.	343.	347.	347.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 5

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1594.	600.	182.	88.	26524.
CMS	45.	17.	5.	3.	751.
INCHES		3.99	4.84	4.90	4.90
MM		101.27	122.92	124.35	124.35
AC-FT		298.	361.	365.	365.
THOUS CU M		367.	445.	451.	451.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 6

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1915.	751.	224.	109.	32630.
CMS	54.	21.	6.	3.	924.
INCHES		4.99	5.96	6.02	6.02
MM		126.72	151.26	152.97	152.97
AC-FT		372.	444.	449.	449.
THOUS CU M		459.	548.	564.	554.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 7

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3168.	1352.	393.	190.	57139.
CMS	90.	38.	11.	5.	1618.
INCHES		8.98	10.43	10.55	10.55
MM		228.17	265.03	267.87	267.87
AC-FT		670.	779.	787.	787.
THOUS CU M		827.	960.	971.	971.

Sh 23

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 8

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5323.	2086.	605.	293.	88002.
CMS	151.	59.	17.	8.	2492.
INCHES		13.86	16.08	16.24	16.24
MM		352.13	408.31	412.56	412.56
AC-FT		1035.	1200.	1212.	1212.
THOUS CU M		1276.	1480.	1495.	1495.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 9

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7270.	2790.	818.	397.	119029.
CMS	206.	79.	23.	11.	3371.
INCHES		18.54	21.75	21.97	21.97
MM		470.94	552.36	558.02	558.02
AC-FT		1384.	1623.	1640.	1640.
THOUS CU M		1707.	2002.	2022.	2022.

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HYDROGRAPH ROUTING

OUTFLOW FROM LOOKOVER LAKE DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
OUTFLO	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1119.	-1

STAGE	1118.50	1119.00	1119.50	1120.50	1121.50	1123.50	1128.50	1133.50
FLOW	0.00	8.00	22.00	518.00	1457.00	4357.00	17214.00	38751.00
SURFACE AREA=	0.	13.	31.	57.				
CAPACITY=	0.	39.	498.	1365.				
ELEVATION=	1110.	1119.	1140.	1160.				

UNITED COMPUTING SYSTEMS, INC.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1118.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1119.5	0.0	0.0	0.

STATION OUTFLO, PLAN 1, RATIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	60.	45.	17.	8.	2535.
CMS	2.	1.	0.	0.	72.
INCHES		.30	.46	.47	.47
MM		7.53	11.76	11.88	11.88
AC-FT		22.	35.	35.	35.
THOUS CU M		27.	43.	43.	43.

STATION OUTFLO, PLAN 1, RATIO 2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	235.	149.	51.	24.	7332.
CMS	7.	4.	1.	1.	208.
INCHES		.99	1.34	1.35	1.35
MM		25.16	34.13	34.37	34.37
AC-FT		74.	100.	101.	101.

Sh 24

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                                   STATION OUTFLO, PLAN 1, RATIO 3

                           PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                  CFS      695.      299.        92.        44.          13347.
                  CMS       20.        8.         3.         1.            378.
               INCHES               1.98       2.45       2.46           2.46
                   MM              50.38      62.21      62.57          62.57
                AC-FT               148.       183.       184.           184.
            THOUS CU M              183.       225.       227.           227.


                                   STATION OUTFLO, PLAN 1, RATIO 4
                           PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                  CFS     1146.      448.       134.        65.          19403.
                  CMS       32.       13.         4.         2.            549.
               INCHES               2.98       3.56       3.58           3.58
                   MM              75.66      90.48      90.96          90.96
                AC-FT               222.       266.       267.           267.
            THOUS CU M              274.       328.       330.           330.
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UNITED COMPUTING SYSTEMS, INC.

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                                   STATION OUTFLO, PLAN 1, RATIO 5
                           PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                  CFS     1495.      599.       176.        85.          25487.
                  CMS       42.       17.         5.         2.            722.
               INCHES               3.98       4.68       4.70           4.70
                   MM             101.02     118.88     119.49         119.49
                AC-FT               297.       349.       351.           351.
            THOUS CU M              366.       431.       433.           433.


                                   STATION OUTFLO, PLAN 1, RATIO 6

                           PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                  CFS     1846.      749.       218.       105.          31583.
                  CMS       52.       21.         6.         3.            894.
               INCHES               4.98       5.80       5.83           5.83
                   MM             126.39     147.33     148.06         148.06
                AC-FT               371.       433.       435.           435.
            THOUS CU M              458.       534.       537.           537.


                                   STATION OUTFLO, PLAN 1, RATIO 7 (½ PMF)

                                  END-OF-PERIOD HYDROGRAPH ORDINATES

                                            OUTFLOW
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
          0.        0.        0.        0.        0.        0.        1.        1.        1.        2.
          2.        2.        2.        3.        3.        3.        3.        4.        4.        4.
          4.        4.        4.        4.        4.        4.        4.        4.        4.        4.
          5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
          5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
          5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
          5.        5.        5.        6.        6.        6.        6.        6.        6.        6.
          6.        6.        7.        7.        7.        7.        7.        7.        7.        7.
          8.        8.        8.        8.        8.        8.        8.        9.        9.        9.
          9.        9.       10.       10.       11.       12.       12.       13.       14.       15.
         16.       16.       17.       18.       19.       19.       20.       21.       22.       33.
         41.       47.       50.       53.       55.       56.       58.       59.       60.       61.
         62.       63.       64.       65.       66.       67.       69.       78.       97.      124.
        152.      184.      230.      294.      380.      491.      659.      791.      877.      940.
        997.     1053.     1108.     1155.     1194.     1225.     1273.     1416.     1852.     2437.
       2901.     3069.     2951.     2674.     2357.     2066.     1824.     1630.     1472.     1368.
       1270.     1183.     1109.     1029.      923.      787.      638.      507.      439.      381.
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                                                      STORAGE
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
      39.       39.       39.       39.       39.       39.       40.       40.       40.       40.
      41.       41.       41.       41.       41.       42.       42.       42.       42.       42.
      42.       42.       42.       42.       43.       43.       43.       43.       43.       43.
      43.       43.       43.       43.       43.       43.       43.       43.       43.       43.
      43.       43.       43.       43.       43.       43.       43.       43.       43.       43.
      43.       43.       43.       43.       43.       43.       43.       43.       43.       43.
      43.       43.       44.       44.       44.       44.       44.       44.       44.       44.
      44.       44.       44.       45.       45.       45.       45.       45.       45.       45.
      45.       45.       45.       45.       46.       46.       46.       46.       46.       46.
      46.       46.       46.       47.       47.       47.       48.       48.       48.       49.
      49.       50.       50.       50.       51.       51.       51.       52.       52.       53.
      53.       53.       53.       53.       53.       53.       53.       53.       53.       53.
      53.       53.       53.       54.       54.       54.       54.       54.       54.       55.
      56.       57.       58.       60.       62.       66.       69.       71.       72.       73.
      74.       75.       75.       76.       77.       77.       78.       80.       85.       91.
      96.       98.       97.       94.       91.       87.       85.       83.       81.       80.
      78.       77.       76.       74.       73.       70.       68.       66.       64.       62.
      61.       60.       59.       59.       58.       58.       57.       57.       56.       56.
      56.       55.       55.       55.       55.       55.       54.       54.       54.       54.
      54.       54.       54.       54.       54.       54.       54.       54.       54.       54.
      54.       54.       54.       54.       54.       54.       53.       53.       53.       53.

                                                       STAGE
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.6    1118.6    1118.6
    1118.6    1118.6    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7
    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8
    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8
    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8
    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8
    1118.8    1118.8    1118.8    1118.8    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9
    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1119.0    1119.0
    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0
    1119.0    1119.0    1119.1    1119.1    1119.1    1119.1    1119.2    1119.2    1119.2    1119.2
    1119.3    1119.3    1119.3    1119.4    1119.4    1119.4    1119.4    1119.5    1119.5    1119.5
    1119.5    1119.5    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6
    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.7    1119.7
    1119.8    1119.8    1119.9    1120.0    1120.2    1120.4    1120.7    1120.8    1120.9    1120.9
    1121.0    1121.1    1121.1    1121.2    1121.2    1121.3    1121.3    1121.5    1121.8    1122.2
    1122.5    1122.6    1122.5    1122.3    1122.1    1121.9    1121.8    1121.6    1121.5    1121.4
    1121.3    1121.2    1121.1    1121.0    1120.9    1120.8    1120.6    1120.5    1120.3    1120.2
    1120.1    1120.1    1120.0    1120.0    1119.9    1119.9    1119.9    1119.8    1119.8    1119.8
    1119.7    1119.7    1119.7    1119.7    1119.7    1119.7    1119.6    1119.6    1119.6    1119.6
    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6
    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6

 PEAK OUTFLOW IS     3069. AT TIME  40.33 HOURS
```

Sh 26

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                           PEAK    6-HOUR    24-HOUR   72-HOUR   TOTAL VOLUME
                  CFS      3069.    1345.      388.      187.        56073.
                  CMS        87.      38.       11.        5.         1588.
               INCHES                8.93     10.30     10.35         10.35
                   MM              226.93    261.66    262.87        262.87
                AC-FT                667.      769.      772.          772.
            THOUS CU M               822.      948.      953.          953.
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                                        STATION OUTFLO, PLAN 1, RATIO 8

                                  PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                          CFS     5897.    2076.     601.      290.       86934.
                          CMS      144.      59.      17.        8.        2462.
                       INCHES              13.80     15.97     16.05       16.05
                           MM             350.44    405.74    407.55      407.55
                        AC-FT               1030.     1192.     1197.       1197.
                    THOUS CU M             1270.     1470.     1477.       1477.

                                        STATION OUTFLO, PLAN 1, RATIO 9

                                        END-OF-PERIOD HYDROGRAPH ORDINATES

                                                   OUTFLOW
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
             0.        0.        0.        0.        0.        1.        1.        2.        3.        3.
             4.        4.        5.        5.        6.        6.        7.        7.        7.        8.
             8.        8.        9.        9.        9.        9.        9.        9.        9.        9.
            10.       10.       10.       10.       10.       10.       10.       10.       10.       10.
            10.       10.       10.       10.       10.       10.       10.       10.       10.       10.
            10.       10.       10.       10.       10.       10.       10.       11.       11.       11.
            12.       12.       12.       12.       13.       13.       13.       14.       14.       14.
            15.       15.       15.       16.       16.       16.       17.       17.       17.       18.
            18.       18.       18.       19.       19.       19.       20.       20.       20.       21.
            21.       21.       25.       39.       52.       62.       70.       76.       82.       86.
            89.       92.       95.       98.      100.      102.      104.      106.      108.      110.
           112.      115.      123.      136.      151.      166.      180.      193.      204.      214.
           223.      230.      237.      242.      247.      250.      258.      282.      343.      465.
           715.      976.     1181.     1347.     1499.     1658.     1769.     1854.     1922.     1990.
          2072.     2167.     2264.     2350.     2417.     2473.     2575.     2910.     3817.     5694.
          7056.     6894.     5903.     4770.     4018.     3555.     3243.     3007.     2793.     2595.
          2419.     2274.     2148.     1996.     1775.     1487.     1247.     1001.      792.      634.
           521.      470.      423.      383.      354.      330.      310.      293.      276.      261.
           247.      233.      220.      207.      195.      184.      174.      165.      157.      151.
           145.      140.      136.      133.      130.      127.      125.      124.      122.      119.
           117.      113.      109.      105.      101.       97.       92.       88.       83.       79.

                                                   STORAGE
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
            39.       39.       39.       39.       39.       40.       40.       41.       41.       42.
            42.       43.       43.       43.       44.       44.       44.       45.       45.       45.
            46.       46.       46.       46.       46.       46.       46.       46.       46.       46.
            46.       46.       46.       46.       46.       46.       47.       47.       47.       47.
            47.       47.       47.       47.       47.       47.       47.       47.       47.       47.
            47.       47.       47.       47.       47.       47.       47.       47.       47.       47.
            47.       47.       48.       48.       48.       48.       48.       48.       49.       49.
            49.       49.       49.       49.       49.       50.       50.       50.       50.       50.
            50.       50.       51.       51.       51.       51.       51.       51.       52.       52.
            52.       52.       52.       53.       53.       53.       54.       54.       54.       54.
            54.       54.       54.       54.       54.       55.       55.       55.       55.       55.
            55.       55.       55.       55.       56.       56.       57.       57.       57.       58.
            58.       58.       58.       58.       59.       59.       59.       60.       61.       65.
            69.       73.       77.       79.       81.       83.       84.       85.       86.       87.
            87.       88.       90.       90.       91.       92.       93.       96.      106.      121.
           130.      129.      123.      115.      109.      104.      100.       98.       95.       93.
            91.       90.       88.       87.       84.       81.       78.       74.       71.       68.
            66.       65.       64.       62.       62.       61.       60.       60.       59.       59.
            59.       58.       58.       57.       57.       57.       57.       56.       56.       56.
            56.       56.       55.       55.       55.       55.       55.       55.       55.       55.
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Sh 27

```
                                                        STAGE
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.5
       1118.5   1118.5   1118.5   1118.5   1118.5   1118.5   1118.6   1118.6   1118.7   1118.7
       1118.7   1118.8   1118.8   1118.8   1118.9   1118.9   1118.9   1118.9   1119.0   1119.0
       1119.0   1119.0   1119.0   1119.0   1119.0   1119.0   1119.0   1119.0   1119.0   1119.1
       1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1
       1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1
       1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1   1119.1
       1119.1   1119.1   1119.1   1119.2   1119.2   1119.2   1119.2   1119.2   1119.2   1119.2
       1119.2   1119.3   1119.3   1119.3   1119.3   1119.3   1119.3   1119.3   1119.3   1119.3
       1119.4   1119.4   1119.4   1119.4   1119.4   1119.4   1119.4   1119.4   1119.4   1119.5
       1119.5   1119.5   1119.5   1119.5   1119.6   1119.6   1119.6   1119.6   1119.6   1119.6
       1119.6   1119.6   1119.6   1119.7   1119.7   1119.7   1119.7   1119.7   1119.7   1119.7
       1119.7   1119.7   1119.7   1119.7   1119.8   1119.8   1119.8   1119.8   1119.9   1119.9
       1119.9   1119.9   1119.9   1119.9   1120.0   1120.0   1120.0   1120.0   1120.1   1120.4
       1120.7   1121.0   1121.2   1121.4   1121.5   1121.6   1121.7   1121.8   1121.8   1121.9
       1121.9   1122.0   1122.1   1122.1   1122.2   1122.2   1122.3   1122.5   1123.1   1124.0
       1124.5   1124.5   1124.1   1123.7   1123.3   1122.9   1122.7   1122.6   1122.4   1122.3
       1122.2   1122.1   1122.0   1121.9   1121.7   1121.5   1121.3   1121.0   1120.8   1120.6
       1120.5   1120.4   1120.3   1120.2   1120.2   1120.1   1120.1   1120.0   1120.0   1120.0
       1120.0   1119.9   1119.9   1119.9   1119.8   1119.8   1119.8   1119.8   1119.8   1119.8
       1119.7   1119.7   1119.7   1119.7   1119.7   1119.7   1119.7   1119.7   1119.7   1119.7
       1119.7   1119.7   1119.7   1119.7   1119.7   1119.7   1119.6   1119.6   1119.6   1119.6

  PEAK OUTFLOW IS      7056. AT TIME  40.17 HOURS

                              PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                      CFS     7056.    2781.      815.       393.        117932.
                      CMS      200.      79.       23.        11.          3339.
                   INCHES              18.48     21.67      21.77          21.77
                       MM             469.41    550.33     552.87         552.87
                    AC-FT               1379.     1617.      1624.          1624.
              THOUS CU M               1701.     1994.      2004.          2004.


              PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                               FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
                                        AREA IN SQUARE MILES (SQUARE KILOMETERS)

                                                              RATIOS APPLIED TO FLOWS
  OPERATION       STATION      AREA     PLAN  RATIO 1  RATIO 2  RATIO 3  RATIO 4  RATIO 5  RATIO 6  RATIO 7  RATIO 8  RATIO 9
                                                  .05      .10      .15      .20      .25      .30      .50      .75     1.00

  HYDROGRAPH AT   INFLOW       1.10       1      310.     620.     929.    1239.    1549.    1859.    3098.    4646.    6195.
                           (   2.85)         (  8.77)( 17.54)( 26.31)( 35.09)( 43.86)( 52.63)( 87.71)(131.57)( 175.43)

  ROUTED TO       OUTFLO       1.10       1       37.     187.     596.     965.    1233.    1481.    2450.    4155.    5712.
                           (   2.85)         (  1.06)(  5.29)( 16.88)( 27.33)( 34.92)( 41.93)( 69.38)(117.65)( 161.75)

  HYDROGRAPH AT   INFLOW        .30       1       84.     169.     253.     338.     422.     507.     845.    1267.    1690.
                           (    .78)         (  2.39)(  4.78)(  7.18)(  9.57)( 11.96)( 14.35)( 23.92)( 35.88)(  47.84)

   2 COMBINED     COMBIN       1.40       1      104.     241.     778.    1240.    1594.    1915.    3168.    5323.    7270.
                           (   3.63)         (  2.93)(  6.82)( 22.04)( 35.12)( 45.14)( 54.23)( 89.70)(150.74)( 205.87)

  ROUTED TO       OUTFLO       1.40       1       60.     235.     695.    1146.    1495.    1846.    3069.    5097.    7056.
                           (   3.63)         (  1.71)(  6.66)( 19.68)( 32.45)( 42.34)( 52.28)( 86.89)(144.32)( 199.81)
```

Sh 28

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1130.00	1130.00	1132.50
STORAGE	93.	93.	170.
OUTFLOW	0.	0.	59.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.05	1131.73	0.00	145.	37.	0.00	42.50	0.00
.10	1132.80	.30	181.	187.	3.67	41.33	0.00
.15	1133.26	.76	197.	596.	4.83	40.50	0.00
.20	1133.55	1.05	207.	965.	6.00	40.33	0.00
.25	1133.77	1.27	215.	1233.	6.83	40.33	0.00
.30	1133.96	1.46	223.	1481.	7.67	40.33	0.00
.50	1134.73	2.23	252.	2450.	9.83	40.33	0.00
.75	1135.40	2.90	279.	4155.	13.33	40.17	0.00
1.00	1135.86	3.36	298.	5712.	16.50	40.17	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1118.50	1118.50	1119.50
STORAGE	39.	39.	52.
OUTFLOW	0.	0.	22.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.05	1119.58	.08	53.	60.	9.67	41.33	0.00
.10	1119.93	.43	58.	235.	11.17	41.50	0.00
.15	1120.69	1.19	69.	695.	12.17	40.67	0.00
.20	1121.17	1.67	76.	1146.	12.83	40.50	0.00
.25	1121.53	2.03	81.	1495.	13.17	40.33	0.00
.30	1121.77	2.27	85.	1846.	13.67	40.33	0.00
.50	1122.61	3.11	98.	3069.	16.83	40.33	0.00
.75	1123.79	4.29	117.	5097.	18.67	40.33	0.00
1.00	1124.55	5.05	130.	7050.	19.67	40.17	0.00

Sh 29

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**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
 LAST MODIFICATION  26-FEB-79
**********
    1  A1                          NATIONAL DAM INSPECTION PROGRAM
    2  A2                                LOOKOVER LAKE DAM
    3  A3                                BREACH ANALYSIS
    4  B    300       0      10       0       0       0       0       0      -3       0
    5  B1     5
    6  J      2       1       1
    7  J1   .15
    8  K      0  INFLOW                                                  1
    9  K1                              INFLOW TO BEARFORT WATERS
   10  M      1       2     1.1              1.4                                     1
   11  P      0      22     111     123     133     142
   12  T                                                        1.0     .05
   13  W2           0.44
   14  X   -1.5    -.05       2
   15  K      1  OUTFLO                                                  1
   16  K1                             OUTFLOW FROM BEARFORT WATERS
   17  Y                                      1       1
   18  Y1     1                                                -1130      -1
   19  Y4  1130    1131    1132  1132.5    1133    1135    1140    1145
   20  Y5     0      16      45      59     269    2784   19862   54081
   21  $A     0      28     134     257
   22  $E  1120    1130    1160    1180
   23  $$  1130
   24  $D1132.5
   25  K      0  INFLOW                                                  1
   26  K1                              INFLOW TO LOOKOVER LAKE
   27  M      1       2     0.3              1.4                                     1
   28  P      0      22     111     123     133     142
   29  T                                                        1.0     .05
   30  W2           0.44
   31  X   -1.5    -.05       2
   32  K      2  COMBIN                                                  1
   33  K1                    COMBINE INFLOW AND BEARFORT WATERS OUTFLOW
   34  K      1  OUTFLO                                                  1
   35  K1                            OUTFLOW FROM LOOKOVER LAKE DAM
   36  Y                                      1       1
   37  Y1     1                                                -1118.5      -1
   38  Y4 1118.5    1119    1119.5    1120.5    1121.5    1123.5   1128.5   1133.5
   39  Y5     0       8      22      518      1457      4357    17214    38751
   40  $A     0      13      31       57
   41  $E1109.5  1118.5    1140      1160
   42  $$1118.5
   43  $D1119.5
   44  $B   100       1    1113      .17    1118.5      1140
   45  $B   100       1    1113      .17    1118.5    1120.5
   46  K      1  HAZARD                                                  1
   47  K1                          ROUTING BREACH FLOOD TO DOWNSTREAM DAMAGE CENTER
   48  Y                                      1       1
   49  Y1     1                                                  -1
   50  Y6   .06     .04     .00    1105    1120    1000    .005
   51  Y7     0    1120      50    1114     100    1108     107    1105     113    1105
   52  Y7   120    1108     160    1114     200    1120
   53  K     99
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Sh 30

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FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
****

RUN DATE= 06/04/80.
TIME= 12.15.30.

NATIONAL DAM INSPECTION PROGRAM
LOOKOVER LAKE DAM
BREACH ANALYSIS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
300	0	10	0	0	0	0	0	-3	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 2 NRTIO= 1 LRTIO= 1

RTIOS= .15

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INFLOW TO BEARFORT WATERS

	ISTAQ	IGOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
INFLOW		0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	1.10	0.00	1.40	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.00	111.00	123.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TC= 0.00 LAG= .44

RECESSION DATA

STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 15 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .44 VOL= 1.00

210.	734.	1013.	894.	579.	330.	202.	120.	71.	42.
25.	15.	9.	5.	3.					

SH 31

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.10	1	.00	0.00	.00	2.	1.02	1.10	151	.02	.01	.01	45.
1.01	.20	2	.00	0.00	.00	1.	1.02	1.20	152	.02	.01	.01	46.
1.01	.30	3	.00	0.00	.00	1.	1.02	1.30	153	.02	.01	.01	47.
1.01	.40	4	.00	0.00	.00	1.	1.02	1.40	154	.02	.01	.01	47.
1.01	.50	5	.00	0.00	.00	1.	1.02	1.50	155	.02	.01	.01	47.
1.01	1.00	6	.00	0.00	.00	1.	1.02	2.00	156	.02	.01	.01	48.
1.01	1.10	7	.00	0.00	.00	1.	1.02	2.10	157	.02	.01	.01	48.
1.01	1.20	8	.00	0.00	.00	1.	1.02	2.20	158	.02	.01	.01	48.
1.01	1.30	9	.00	0.00	.00	1.	1.02	2.30	159	.02	.01	.01	48.
1.01	1.40	10	.00	0.00	.00	1.	1.02	2.40	160	.02	.01	.01	48.
1.01	1.50	11	.00	0.00	.00	1.	1.02	2.50	161	.02	.01	.01	48.
1.01	2.00	12	.00	0.00	.00	1.	1.02	3.00	162	.02	.01	.01	48.
1.01	2.10	13	.00	0.00	.00	1.	1.02	3.10	163	.02	.01	.01	48.
1.01	2.20	14	.00	0.00	.00	1.	1.02	3.20	164	.02	.01	.01	48.
1.01	2.30	15	.00	0.00	.00	1.	1.02	3.30	165	.02	.01	.01	48.
1.01	2.40	16	.00	0.00	.00	1.	1.02	3.40	166	.02	.01	.01	48.
1.01	2.50	17	.00	0.00	.00	1.	1.02	3.50	167	.02	.01	.01	48.
1.01	3.00	18	.00	0.00	.00	0.	1.02	4.00	168	.02	.01	.01	48.
1.01	3.10	19	.00	0.00	.00	0.	1.02	4.10	169	.02	.01	.01	48.
1.01	3.20	20	.00	0.00	.00	0.	1.02	4.20	170	.02	.01	.01	48.
1.01	3.30	21	.00	0.00	.00	0.	1.02	4.30	171	.02	.01	.01	48.
1.01	3.40	22	.00	0.00	.00	0.	1.02	4.40	172	.02	.01	.01	48.
1.01	3.50	23	.00	0.00	.00	0.	1.02	4.50	173	.02	.01	.01	48.
1.01	4.00	24	.00	0.00	.00	0.	1.02	5.00	174	.02	.01	.01	48.
1.01	4.10	25	.00	0.00	.00	0.	1.02	5.10	175	.02	.01	.01	48.
1.01	4.20	26	.00	0.00	.00	0.	1.02	5.20	176	.02	.01	.01	48.
1.01	4.30	27	.00	0.00	.00	0.	1.02	5.30	177	.02	.01	.01	48.
1.01	4.40	28	.00	0.00	.00	0.	1.02	5.40	178	.02	.01	.01	48.
1.01	4.50	29	.00	0.00	.00	0.	1.02	5.50	179	.02	.01	.01	48.
1.01	5.00	30	.00	0.00	.00	0.	1.02	6.00	180	.02	.01	.01	48.
1.01	5.10	31	.00	0.00	.00	0.	1.02	6.10	181	.06	.05	.01	56.
1.01	5.20	32	.00	0.00	.00	0.	1.02	6.20	182	.06	.05	.01	85.
1.01	5.30	33	.00	0.00	.00	0.	1.02	6.30	183	.06	.05	.01	124.
1.01	5.40	34	.00	0.00	.00	0.	1.02	6.40	184	.06	.05	.01	159.
1.01	5.50	35	.00	0.00	.00	0.	1.02	6.50	185	.06	.05	.01	182.
1.01	6.00	36	.00	0.00	.00	0.	1.02	7.00	186	.06	.05	.01	195.
1.01	6.10	37	.00	0.00	.00	0.	1.02	7.10	187	.06	.05	.01	203.
1.01	6.20	38	.00	0.00	.00	0.	1.02	7.20	188	.06	.05	.01	208.
1.01	6.30	39	.00	0.00	.00	0.	1.02	7.30	189	.06	.05	.01	210.
1.01	6.40	40	.00	0.00	.00	0.	1.02	7.40	190	.06	.05	.01	212.
1.01	6.50	41	.00	0.00	.00	0.	1.02	7.50	191	.06	.05	.01	213.
1.01	7.00	42	.00	0.00	.00	0.	1.02	8.00	192	.06	.05	.01	214.
1.01	7.10	43	.00	0.00	.00	0.	1.02	8.10	193	.06	.05	.01	214.
1.01	7.20	44	.00	0.00	.00	0.	1.02	8.20	194	.06	.05	.01	214.
1.01	7.30	45	.00	0.00	.00	0.	1.02	8.30	195	.06	.05	.01	214.
1.01	7.40	46	.00	0.00	.00	0.	1.02	8.40	196	.06	.05	.01	214.
1.01	7.50	47	.00	0.00	.00	0.	1.02	8.50	197	.06	.05	.01	214.
1.01	8.00	48	.00	0.00	.00	0.	1.02	9.00	198	.06	.05	.01	214.
1.01	8.10	49	.00	0.00	.00	0.	1.02	9.10	199	.06	.05	.01	214.
1.01	8.20	50	.00	0.00	.00	0.	1.02	9.20	200	.06	.05	.01	214.
1.01	8.30	51	.00	0.00	.00	0.	1.02	9.30	201	.06	.05	.01	214.
1.01	8.40	52	.00	0.00	.00	0.	1.02	9.40	202	.06	.05	.01	214.
1.01	8.50	53	.00	0.00	.00	0.	1.02	9.50	203	.06	.05	.01	214.
1.01	9.00	54	.00	0.00	.00	0.	1.02	10.00	204	.06	.05	.01	214.
1.01	9.10	55	.00	0.00	.00	0.	1.02	10.10	205	.06	.05	.01	214.
1.01	9.20	56	.00	0.00	.00	0.	1.02	10.20	206	.06	.05	.01	214.
1.01	9.30	57	.00	0.00	.00	0.	1.02	10.30	207	.06	.05	.01	214.
1.01	9.40	58	.00	0.00	.00	0.	1.02	10.40	208	.06	.05	.01	214.
1.01	9.50	59	.00	0.00	.00	0.	1.02	10.50	209	.06	.05	.01	214.
1.01	10.00	60	.00	0.00	.00	0.	1.02	11.00	210	.06	.05	.01	214.
1.01	10.10	61	.00	0.00	.00	0.	1.02	11.10	211	.06	.05	.01	214.
1.01	10.20	62	.00	0.00	.00	0.	1.02	11.20	212	.06	.05	.01	214.
1.01	10.30	63	.00	0.00	.00	0.	1.02	11.30	213	.06	.05	.01	214.
1.01	10.40	64	.00	0.00	.00	0.	1.02	11.40	214	.06	.05	.01	214.
1.01	10.50	65	.00	0.00	.00	0.	1.02	11.50	215	.06	.05	.01	214.
1.01	11.00	66	.00	0.00	.00	0.	1.02	12.00	216	.06	.05	.01	214.
1.01	11.10	67	.00	0.00	.00	0.	1.02	12.10	217	.33	.32	.01	272.
1.01	11.20	68	.00	0.00	.00	0.	1.02	12.20	218	.33	.32	.01	467.
1.01	11.30	69	.00	0.00	.00	0.	1.02	12.30	219	.33	.32	.01	738.
1.01	11.40	70	.00	0.00	.00	0.	1.02	12.40	220	.33	.32	.01	976.
1.01	11.50	71	.00	0.00	.00	0.	1.02	12.50	221	.33	.32	.01	1131.

UNITED COMPUTING SYSTEMS, INC.

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1.01	12.10	73	.02	0.00	.02	0.	1.02	13.10	223	.39	.38	.01	1287.
1.01	12.20	74	.02	0.00	.02	0.	1.02	13.20	224	.39	.38	.01	1367.
1.01	12.30	75	.02	0.00	.02	0.	1.02	13.30	225	.39	.38	.01	1452.
	12.40	76	.02	0.00	.02	0.	1.02	13.40	226	.39	.38	.01	1521.
	12.50	77	.02	0.00	.02	0.	1.02	13.50	227	.39	.38	.01	1566.
1.01	13.00	78	.02	0.00	.02	0.	1.02	14.00	228	.39	.38	.01	1591.
1.01	13.10	79	.03	0.00	.03	0.	1.02	14.10	229	.49	.48	.01	1628.
1.01	13.20	80	.03	0.00	.03	0.	1.02	14.20	230	.49	.48	.01	1709.
1.01	13.30	81	.03	0.00	.03	0.	1.02	14.30	231	.49	.48	.01	1813.
1.01	13.40	82	.03	0.00	.03	0.	1.02	14.40	232	.49	.48	.01	1903.
1.01	13.50	83	.03	0.00	.03	0.	1.02	14.50	233	.49	.48	.01	1961.
1.01	14.00	84	.03	0.00	.03	0.	1.02	15.00	234	.49	.48	.01	1994.
1.01	14.10	85	.03	0.00	.03	0.	1.02	15.10	235	.45	.44	.01	2006.
1.01	14.20	86	.03	0.00	.03	0.	1.02	15.20	236	.74	.73	.01	2050.
1.01	14.30	87	.03	0.00	.03	0.	1.02	15.30	237	1.34	1.33	.01	2359.
1.01	14.40	88	.03	0.00	.03	0.	1.02	15.40	238	3.34	3.33	.01	3494.
1.01	14.50	89	.03	0.00	.03	0.	1.02	15.50	239	.97	.96	.01	5293.
1.01	15.00	90	.03	0.00	.03	0.	1.02	16.00	240	.59	.59	.01	6195.
1.01	15.10	91	.03	0.00	.03	0.	1.02	16.10	241	.46	.45	.01	5713.
1.01	15.20	92	.05	0.00	.05	0.	1.02	16.20	242	.46	.45	.01	4524.
1.01	15.30	93	.09	0.00	.09	0.	1.02	16.30	243	.46	.45	.01	3491.
1.01	15.40	94	.23	.07	.15	16.	1.02	16.40	244	.46	.45	.01	2862.
1.01	15.50	95	.07	.06	.01	66.	1.02	16.50	245	.46	.45	.01	2474.
1.01	16.00	96	.04	.03	.01	123.	1.02	17.00	246	.46	.45	.01	2243.
1.01	16.10	97	.03	.02	.01	152.	1.02	17.10	247	.36	.35	.01	2084.
1.01	16.20	98	.03	.02	.01	147.	1.02	17.20	248	.36	.35	.01	1932.
1.01	16.30	99	.03	.02	.01	130.	1.02	17.30	249	.36	.35	.01	1785.
1.01	16.40	100	.03	.02	.01	116.	1.02	17.40	250	.36	.35	.01	1670.
1.01	16.50	101	.03	.02	.01	108.	1.02	17.50	251	.36	.35	.01	1595.
1.01	17.00	102	.03	.02	.01	103.	1.02	18.00	252	.36	.35	.01	1548.
1.01	17.10	103	.02	.02	.01	99.	1.02	18.10	253	.03	.02	.01	1448.
1.01	17.20	104	.02	.02	.01	92.	1.02	18.20	254	.03	.02	.01	1194.
1.01	17.30	105	.02	.02	.01	85.	1.02	18.30	255	.03	.02	.01	854.
1.01	17.40	106	.02	.02	.01	78.	1.02	18.40	256	.03	.02	.01	556.
1.01	17.50	107	.02	.02	.01	74.	1.02	18.50	257	.03	.02	.01	363.
1.01	18.00	108	.02	.02	.01	71.	1.02	19.00	258	.03	.02	.01	299.
1.01	18.10	109	.00	0.00	.00	66.	1.02	19.10	259	.03	.02	.01	279.
1.01	18.20	110	.00	0.00	.00	54.	1.02	19.20	260	.03	.02	.01	260.
1.01	18.30	111	.00	0.00	.00	37.	1.02	19.30	261	.03	.02	.01	243.
1.01	18.40	112	.00	0.00	.00	23.	1.02	19.40	262	.03	.02	.01	227.
1.01	18.50	113	.00	0.00	.00	13.	1.02	19.50	263	.03	.02	.01	211.
1.01	19.00	114	.00	0.00	.00	8.	1.02	20.00	264	.03	.02	.01	197.
1.01	19.10	115	.00	0.00	.00	7.	1.02	20.10	265	.03	.02	.01	184.
1.01	19.20	116	.00	0.00	.00	7.	1.02	20.20	266	.03	.02	.01	172.
1.01	19.30	117	.00	0.00	.00	6.	1.02	20.30	267	.03	.02	.01	160.
1.01	19.40	118	.00	0.00	.00	6.	1.02	20.40	268	.03	.02	.01	150.
1.01	19.50	119	.00	0.00	.00	5.	1.02	20.50	269	.03	.02	.01	139.
1.01	20.00	120	.00	0.00	.00	5.	1.02	21.00	270	.03	.02	.01	130.
1.01	20.10	121	.00	0.00	.00	5.	1.02	21.10	271	.03	.02	.01	121.
1.01	20.20	122	.00	0.00	.00	4.	1.02	21.20	272	.03	.02	.01	113.
1.01	20.30	123	.00	0.00	.00	4.	1.02	21.30	273	.03	.02	.01	106.
1.01	20.40	124	.00	0.00	.00	4.	1.02	21.40	274	.03	.02	.01	99.
1.01	20.50	125	.00	0.00	.00	4.	1.02	21.50	275	.03	.02	.01	92.
1.01	21.00	126	.00	0.00	.00	3.	1.02	22.00	276	.03	.02	.01	89.
1.01	21.10	127	.00	0.00	.00	3.	1.02	22.10	277	.03	.02	.01	89.
1.01	21.20	128	.00	0.00	.00	3.	1.02	22.20	278	.03	.02	.01	89.
1.01	21.30	129	.00	0.00	.00	3.	1.02	22.30	279	.03	.02	.01	89.
1.01	21.40	130	.00	0.00	.00	3.	1.02	22.40	280	.03	.02	.01	89.
1.01	21.50	131	.00	0.00	.00	2.	1.02	22.50	281	.03	.02	.01	89.
1.01	22.00	132	.00	0.00	.00	2.	1.02	23.00	282	.03	.02	.01	89.
1.01	22.10	133	.00	0.00	.00	2.	1.02	23.10	283	.03	.02	.01	89.
1.01	22.20	134	.00	0.00	.00	2.	1.02	23.20	284	.03	.02	.01	89.
1.01	22.30	135	.00	0.00	.00	2.	1.02	23.30	285	.03	.02	.01	89.
1.01	22.40	136	.00	0.00	.00	2.	1.02	23.40	286	.03	.02	.01	89.
1.01	22.50	137	.00	0.00	.00	2.	1.02	23.50	287	.03	.02	.01	89.
1.01	23.00	138	.00	0.00	.00	1.	1.03	0.00	288	.03	.02	.01	89.
1.01	23.10	139	.00	0.00	.00	1.	1.03	.10	289	0.00	0.00	0.00	85.
1.01	23.20	140	.00	0.00	.00	1.	1.03	.20	290	0.00	0.00	0.00	79.
1.01	23.30	141	.00	0.00	.00	1.	1.03	.30	291	0.00	0.00	0.00	74.
1.01	23.40	142	.00	0.00	.00	1.	1.03	.40	292	0.00	0.00	0.00	69.
1.01	23.50	143	.00	0.00	.00	1.	1.03	.50	293	0.00	0.00	0.00	64.
1.02	0.00	144	.00	0.00	.00	1.	1.03	1.00	294	0.00	0.00	0.00	60.
1.02	.10	145	.02	.01	.01	2.	1.03	1.10	295	0.00	0.00	0.00	56.
1.02	.20	146	.02	.01	.01	11.	1.03	1.20	296	0.00	0.00	0.00	52.
1.02	.30	147	.02	.01	.01	22.	1.03	1.30	297	0.00	0.00	0.00	49.
1.02	.40	148	.02	.01	.01	32.	1.03	1.40	298	0.00	0.00	0.00	45.
1.02	.50	149	.02	.01	.01	39.	1.03	1.50	299	0.00	0.00	0.00	42.
1.02	1.00	150	.02	.01	.01	42.	1.03	2.00	300	0.00	0.00	0.00	40.
									SUM	24.99	22.60	2.39	97931.
										(635.)(574.)(61.)(2773.10)			

SH 33

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6195.	2219.	665.	326.	97926.
CMS	175.	63.	19.	9.	2773.
INCHES		18.76	22.49	23.00	23.00
MM		476.59	571.34	584.29	584.29
AC-FT		1100.	1319.	1349.	1349.
THOUS CU M		1357.	1627.	1664.	1664.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	929.	333.	100.	49.	14689.
CMS	26.	9.	3.	1.	416.
INCHES		2.81	3.37	3.45	3.45
MM		71.49	85.70	87.64	87.64
AC-FT		165.	198.	202.	202.
THOUS CU M		204.	244.	250.	250.

PLAN 2 SAME AS PLAN 1

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

OUTFLOW FROM BEARFORT WATERS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
OUTFLO	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1130.	-1

STAGE	1130.00	1131.00	1132.00	1132.50	1133.00	1135.00	1140.00	1145.00
FLOW	0.00	16.00	45.00	59.00	269.00	2784.00	19862.00	54081.00
SURFACE AREA=	0.	28.	124.	257.				
CAPACITY=	0.	93.	2328.	6170.				
ELEVATION=	1120.	1130.	1160.	1180.				

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1130.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1132.5	0.0	0.0	0

Sh 34

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                              STATION OUTFLO, PLAN 1, RATIO 1

                              END-OF-PERIOD HYDROGRAPH ORDINATES

                                        OUTFLOW
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
        0.        0.        0.        0.        0.        0.        0.        1.        1.        1.
        1.        1.        1.        1.        1.        1.        2.        2.        2.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.        2.        2.        2.        2.        1.        2.        2.        2.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.        2.        2.        3.        3.        3.        3.        3.        3.        3.
        3.        3.        3.        3.        3.        3.        4.        4.        4.        4.
        4.        5.        5.        5.        5.        6.        6.        6.        6.        6.
        7.        7.        7.        7.        7.        7.        8.        8.        8.        8.
        8.        9.        9.        9.        9.        9.        9.       10.       10.       11.
       12.       14.       15.       16.       19.       22.       24.       27.       30.       32.
       35.       38.       41.       45.       48.       51.       54.       58.      142.      253.
      481.      593.      596.      549.      491.      437.      393.      357.      326.      300.
      278.      266.      260.      251.      236.      216.      193.      171.      151.      134.
      120.      107.       95.       85.       76.       69.       62.       59.       58.       58.
       58.       57.       57.       56.       56.       55.       55.       54.       54.       53.
       53.       52.       52.       52.       51.       51.       50.       50.       49.       49.
       49.       48.       48.       47.       47.       46.       46.       45.       45.       45.

                                        STORAGE
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       93.       93.       93.       93.       93.
       93.       93.       93.       93.       93.       94.       94.       94.       95.       95.
       95.       95.       95.       96.       96.       96.       96.       96.       96.       96.
       96.       96.       96.       96.       96.       96.       96.       96.       96.       96.
       96.       96.       96.       96.       96.       96.       96.       96.       96.       96.
       96.       96.       96.       96.       96.       96.       96.       96.       96.       96.
       96.       96.       96.       96.       96.       96.       96.       96.       96.       96.
       96.       96.       96.       96.       96.       97.       97.       97.       97.       97.
       97.       97.       97.       97.       97.       97.       97.       97.       97.       98.
       98.       98.       98.       98.       98.       98.       98.       98.       98.       98.
       98.       98.       99.       99.       99.       99.      100.      100.      101.      101.
      101.      102.      102.      102.      103.      103.      104.      104.      104.      105.
      105.      105.      106.      106.      106.      107.      107.      107.      108.      108.
      108.      109.      109.      109.      110.      110.      110.      111.      112.      114.
      116.      118.      120.      123.      125.      128.      131.      134.      137.      140.
      143.      147.      150.      153.      157.      160.      164.      170.      177.      186.
      194.      197.      197.      196.      194.      192.      191.      190.      189.      189.
      188.      187.      187.      186.      185.      183.      181.      180.      178.      177.
      175.      174.      173.      173.      172.      171.      171.      170.      170.      169.
      169.      168.      168.      167.      167.      166.      165.      165.      164.      164.
      163.      163.      162.      162.      161.      161.      160.      160.      159.      159.
      158.      158.      157.      157.      156.      155.      155.      154.      154.      153.
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UNITED COMPUTING SYSTEMS, INC.

Sh 35

```
                                                          STAGE
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0
        1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.0    1130.1
        1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1
        1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1
        1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1
        1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1
        1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1
        1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1
        1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1    1130.1
        1130.2    1130.2    1130.2    1130.2    1130.2    1130.2    1130.2    1130.2    1130.2    1130.2
        1130.2    1130.2    1130.2    1130.2    1130.2    1130.2    1130.2    1130.2    1130.3    1130.3
        1130.3    1130.3    1130.3    1130.3    1130.3    1130.3    1130.4    1130.4    1130.4    1130.4
        1130.4    1130.4    1130.4    1130.4    1130.5    1130.5    1130.5    1130.5    1130.5    1130.5
        1130.5    1130.5    1130.5    1130.6    1130.6    1130.6    1130.6    1130.6    1130.7    1130.7
        1130.8    1130.8    1130.9    1131.0    1131.1    1131.2    1131.3    1131.4    1131.5    1131.6
        1131.7    1131.8    1131.9    1132.0    1132.1    1132.2    1132.3    1132.5    1132.7    1133.0
        1133.2    1133.3    1133.3    1133.2    1133.2    1133.1    1133.1    1133.1    1133.0    1133.0
        1133.0    1133.0    1133.0    1133.0    1132.9    1132.9    1132.8    1132.8    1132.7    1132.7
        1132.6    1132.6    1132.6    1132.6    1132.5    1132.5    1132.5    1132.5    1132.5    1132.5
        1132.4    1132.4    1132.4    1132.4    1132.4    1132.4    1132.3    1132.3    1132.3    1132.3
        1132.3    1132.3    1132.3    1132.2    1132.2    1132.2    1132.2    1132.2    1132.2    1132.1
        1132.1    1132.1    1132.1    1132.1    1132.1    1132.0    1132.0    1132.0    1132.0    1132.0

 PEAK OUTFLOW IS      596. AT TIME  40.50 HOURS

                                   PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                        CFS        596.      225.        71.        35.          10359.
                        CMS         17.        6.         2.         1.            293.
                     INCHES                  1.90       2.41       2.43           2.43
                         MM                 48.29      61.25      61.81          61.81
                      AC-FT                  111.       141.       143.           143.
                  THOUS CU M                 138.       174.       176.           176.

                                          STATION OUTFLO, PLAN 2, RATIO 1

                                         END-OF-PERIOD HYDROGRAPH ORDINATES

                                                     OUTFLOW
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
            0.        0.        0.        0.        0.        0.        0.        1.        1.        1.
            1.        1.        1.        1.        1.        1.        2.        2.        2.        2.
            2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
            2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
            2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
            2.        2.        2.        2.        2.        1.        2.        2.        2.        2.
            2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
            2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
            2.        2.        2.        3.        3.        3.        3.        3.        3.        3.
            3.        3.        3.        3.        3.        3.        4.        4.        4.        4.
            4.        5.        5.        5.        5.        6.        6.        6.        6.        6.
            7.        7.        7.        7.        7.        7.        8.        8.        8.        8.
            8.        9.        9.        9.        9.        9.        9.       10.       10.       11.
           12.       14.       15.       16.       19.       22.       24.       27.       30.       32.
           35.       38.       41.       45.       48.       51.       54.       58.      142.      253.
          481.      593.      596.      549.      491.      437.      393.      357.      326.      300.
          278.      266.      260.      251.      236.      216.      193.      171.      151.      134.
          120.      107.       95.       85.       76.       69.       62.       59.       58.       58.
           58.       57.       57.       56.       56.       55.       55.       54.       54.       53.
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UNITED COMPUTING SYSTEMS, INC.

Sh 36

```
                                                STORAGE
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        93.        93.        93.        93.        93.
     93.        93.        93.        93.        93.        94.        94.        94.        95.        95.
     95.        95.        95.        96.        96.        96.        96.        96.        96.        96.
     96.        96.        96.        96.        96.        96.        96.        96.        96.        96.
     96.        96.        96.        96.        96.        96.        96.        96.        96.        96.
     96.        96.        96.        96.        96.        96.        96.        96.        96.        96.
     96.        96.        96.        96.        96.        96.        96.        96.        96.        96.
     96.        96.        96.        96.        96.        97.        97.        97.        97.        97.
     97.        97.        97.        97.        97.        97.        97.        97.        97.        98.
     98.        98.        98.        98.        98.        98.        98.        98.        98.        98.
     98.        98.        99.        99.        99.        99.       100.       100.       101.       101.
    101.       102.       102.       102.       103.       103.       104.       104.       104.       105.
    105.       105.       106.       106.       106.       107.       107.       107.       108.       108.
    108.       109.       109.       109.       110.       110.       110.       111.       112.       114.
    116.       118.       120.       123.       125.       128.       131.       134.       137.       140.
    143.       147.       150.       153.       157.       160.       164.       170.       177.       186.
    194.       197.       197.       196.       194.       192.       191.       190.       189.       189.
    188.       187.       187.       186.       185.       183.       181.       180.       178.       177.
    175.       174.       173.       173.       172.       171.       171.       170.       170.       169.
    169.       168.       168.       167.       167.       166.       165.       165.       164.       164.
    163.       163.       162.       162.       161.       161.       160.       160.       159.       159.
    158.       158.       157.       157.       156.       155.       155.       154.       154.       153.

                                                  STAGE
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0
   1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.0     1130.1
   1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1
   1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1
   1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1
   1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1
   1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1
   1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1
   1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1     1130.1
   1130.2     1130.2     1130.2     1130.2     1130.2     1130.2     1130.2     1130.2     1130.2     1130.2
   1130.2     1130.2     1130.2     1130.2     1130.2     1130.2     1130.2     1130.2     1130.3     1130.3
   1130.3     1130.3     1130.3     1130.3     1130.3     1130.3     1130.4     1130.4     1130.4     1130.4
   1130.4     1130.4     1130.4     1130.4     1130.5     1130.5     1130.5     1130.5     1130.5     1130.5
   1130.5     1130.5     1130.5     1130.6     1130.6     1130.6     1130.6     1130.6     1130.7     1130.7
   1130.8     1130.8     1130.9     1131.0     1131.1     1131.2     1131.3     1131.4     1131.5     1131.6
   1131.7     1131.8     1131.9     1132.0     1132.1     1132.2     1132.3     1132.5     1132.7     1133.0
   1133.2     1133.3     1133.3     1133.2     1133.2     1133.1     1133.1     1133.1     1133.0     1133.0
   1133.0     1133.0     1133.0     1133.0     1132.9     1132.9     1132.8     1132.8     1132.7     1132.7
   1132.6     1132.6     1132.6     1132.6     1132.5     1132.5     1132.5     1132.5     1132.5     1132.5
   1132.4     1132.4     1132.4     1132.4     1132.4     1132.4     1132.3     1132.3     1132.3     1132.3
   1132.3     1132.3     1132.3     1132.2     1132.2     1132.2     1132.2     1132.2     1132.2     1132.1
   1132.1     1132.1     1132.1     1132.1     1132.1     1132.0     1132.0     1132.0     1132.0     1132.0

  PEAK OUTFLOW IS      596. AT TIME  40.50 HOURS

                                  PEAK    6-HOUR    24-HOUR    72-HOUR   TOTAL VOLUME
                         CFS      596.      225.        71.        35.        10359.
                         CMS       17.        6.         2.         1.          293.
                      INCHES                1.90       2.41       2.43          2.43
                          MM               48.29      61.25      61.81         61.81
                       AC-FT                111.       141.       143.          143.
                   THOUS CU M               138.       174.       176.          176.
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Sh 37

SUB-AREA RUNOFF COMPUTATION

INFLOW TO LOOKOVER LAKE

	ISTAQ	IGOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	INFLOW	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	.30	0.00	1.40	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.00	111.00	123.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TC= 0.00 LAG= .44

RECESSION DATA

STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 15 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .44 VOL= 1.00

59. 200. 276. 244. 158. 90. 55. 33. 19. 11.
7. 6. 5. 4. 3. 2. 1.

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.10	1	.00	0.00	.00	0.	1.02	1.10	151	.02	.01	.01	12.
1.01	.20	2	.00	0.00	.00	0.	1.02	1.20	152	.02	.01	.01	13.
1.01	.30	3	.00	0.00	.00	0.	1.02	1.30	153	.02	.01	.01	13.
1.01	.40	4	.00	0.00	.00	0.	1.02	1.40	154	.02	.01	.01	13.
1.01	.50	5	.00	0.00	.00	0.	1.02	1.50	155	.02	.01	.01	13.
1.01	1.00	6	.00	0.00	.00	0.	1.02	2.00	156	.02	.01	.01	13.
1.01	1.10	7	.00	0.00	.00	0.	1.02	2.10	157	.02	.01	.01	13.
1.01	1.20	8	.00	0.00	.00	0.	1.02	2.20	158	.02	.01	.01	13.
1.01	1.30	9	.00	0.00	.00	0.	1.02	2.30	159	.02	.01	.01	13.
1.01	1.40	10	.00	0.00	.00	0.	1.02	2.40	160	.02	.01	.01	13.
1.01	1.50	11	.00	0.00	.00	0.	1.02	2.50	161	.02	.01	.01	13.
1.01	2.00	12	.00	0.00	.00	0.	1.02	3.00	162	.02	.01	.01	13.
1.01	2.10	13	.00	0.00	.00	0.	1.02	3.10	163	.02	.01	.01	13.
1.01	2.20	14	.00	0.00	.00	0.	1.02	3.20	164	.02	.01	.01	13.
1.01	2.30	15	.00	0.00	.00	0.	1.02	3.30	165	.02	.01	.01	13.
1.01	2.40	16	.00	0.00	.00	0.	1.02	3.40	166	.02	.01	.01	13.
1.01	2.50	17	.00	0.00	.00	0.	1.02	3.50	167	.02	.01	.01	13.
1.01	3.00	18	.00	0.00	.00	0.	1.02	4.00	168	.02	.01	.01	13.
1.01	3.10	19	.00	0.00	.00	0.	1.02	4.10	169	.02	.01	.01	13.
1.01	3.20	20	.00	0.00	.00	0.	1.02	4.20	170	.02	.01	.01	13.
1.01	3.30	21	.00	0.00	.00	0.	1.02	4.30	171	.02	.01	.01	13.
1.01	3.40	22	.00	0.00	.00	0.	1.02	4.40	172	.02	.01	.01	13.
1.01	3.50	23	.00	0.00	.00	0.	1.02	4.50	173	.02	.01	.01	13.
1.01	4.00	24	.00	0.00	.00	0.	1.02	5.00	174	.02	.01	.01	13.
1.01	4.10	25	.00	0.00	.00	0.	1.02	5.10	175	.02	.01	.01	13.
1.01	4.20	26	.00	0.00	.00	0.	1.02	5.20	176	.02	.01	.01	13.
1.01	4.30	27	.00	0.00	.00	0.	1.02	5.30	177	.02	.01	.01	13.
1.01	4.40	28	.00	0.00	.00	0.	1.02	5.40	178	.02	.01	.01	13.
1.01	4.50	29	.00	0.00	.00	0.	1.02	5.50	179	.02	.01	.01	13.
1.01	5.00	30	.00	0.00	.00	0.	1.02	6.00	180	.02	.01	.01	13.
1.01	5.10	31	.00	0.00	.00	0.	1.02	6.10	181	.06	.05	.01	15.
1.01	5.20	32	.00	0.00	.00	0.	1.02	6.20	182	.06	.05	.01	23.
1.01	5.30	33	.00	0.00	.00	0.	1.02	6.30	183	.06	.05	.01	34.

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1.01	5.50	35	.00	0.00	.00	0.	1.02	6.50	185	.06	.05	.01	50.
1.01	6.00	36	.00	0.00	.00	0.	1.02	7.00	186	.06	.05	.01	53.
1.01	6.10	37	.00	0.00	.00	0.	1.02	7.10	187	.06	.05	.01	55.
1.01	6.20	38	.00	0.00	.00	0.	1.02	7.20	188	.06	.05	.01	57.
1.01	6.30	39	.00	0.00	.00	0.	1.02	7.30	189	.06	.05	.01	57.
1.01	6.40	40	.00	0.00	.00	0.	1.02	7.40	190	.06	.05	.01	58.
1.01	6.50	41	.00	0.00	.00	0.	1.02	7.50	191	.06	.05	.01	58.
1.01	7.00	42	.00	0.00	.00	0.	1.02	8.00	192	.06	.05	.01	58.
1.01	7.10	43	.00	0.00	.00	0.	1.02	8.10	193	.06	.05	.01	58.
1.01	7.20	44	.00	0.00	.00	0.	1.02	8.20	194	.06	.05	.01	58.
1.01	7.30	45	.00	0.00	.00	0.	1.02	8.30	195	.06	.05	.01	58.
1.01	7.40	46	.00	0.00	.00	0.	1.02	8.40	196	.06	.05	.01	58.
1.01	7.50	47	.00	0.00	.00	0.	1.02	8.50	197	.06	.05	.01	58.
1.01	8.00	48	.00	0.00	.00	0.	1.02	9.00	198	.06	.05	.01	58.
1.01	8.10	49	.00	0.00	.00	0.	1.02	9.10	199	.06	.05	.01	58.
1.01	8.20	50	.00	0.00	.00	0.	1.02	9.20	200	.06	.05	.01	58.
1.01	8.30	51	.00	0.00	.00	0.	1.02	9.30	201	.06	.05	.01	58.
1.01	8.40	52	.00	0.00	.00	0.	1.02	9.40	202	.06	.05	.01	58.
1.01	8.50	53	.00	0.00	.00	0.	1.02	9.50	203	.06	.05	.01	58.
1.01	9.00	54	.00	0.00	.00	0.	1.02	10.00	204	.06	.05	.01	58.
1.01	9.10	55	.00	0.00	.00	0.	1.02	10.10	205	.06	.05	.01	58.
1.01	9.20	56	.00	0.00	.00	0.	1.02	10.20	206	.06	.05	.01	58.
1.01	9.30	57	.00	0.00	.00	0.	1.02	10.30	207	.06	.05	.01	58.
1.01	9.40	58	.00	0.00	.00	0.	1.02	10.40	208	.06	.05	.01	58.
1.01	9.50	59	.00	0.00	.00	0.	1.02	10.50	209	.06	.05	.01	58.
1.01	10.00	60	.00	0.00	.00	0.	1.02	11.00	210	.06	.05	.01	58.
1.01	10.10	61	.00	0.00	.00	0.	1.02	11.10	211	.06	.05	.01	58.
1.01	10.20	62	.00	0.00	.00	0.	1.02	11.20	212	.06	.05	.01	58.
1.01	10.30	63	.00	0.00	.00	0.	1.02	11.30	213	.06	.05	.01	58.
1.01	10.40	64	.00	0.00	.00	0.	1.02	11.40	214	.06	.05	.01	58.
1.01	10.50	65	.00	0.00	.00	0.	1.02	11.50	215	.06	.05	.01	58.
1.01	11.00	66	.00	0.00	.00	0.	1.02	12.00	216	.06	.05	.01	58.
1.01	11.10	67	.00	0.00	.00	0.	1.02	12.10	217	.33	.32	.01	74.
1.01	11.20	68	.00	0.00	.00	0.	1.02	12.20	218	.33	.32	.01	127.
1.01	11.30	69	.00	0.00	.00	0.	1.02	12.30	219	.33	.32	.01	201.
1.01	11.40	70	.00	0.00	.00	0.	1.02	12.40	220	.33	.32	.01	266.
1.01	11.50	71	.00	0.00	.00	0.	1.02	12.50	221	.33	.32	.01	308.
1.01	12.00	72	.00	0.00	.00	0.	1.02	13.00	222	.33	.32	.01	333.
1.01	12.10	73	.02	0.00	.02	0.	1.02	13.10	223	.39	.38	.01	351.
1.01	12.20	74	.02	0.00	.02	0.	1.02	13.20	224	.39	.38	.01	373.
1.01	12.30	75	.02	0.00	.02	0.	1.02	13.30	225	.39	.38	.01	396.
1.01	12.40	76	.02	0.00	.02	0.	1.02	13.40	226	.39	.38	.01	415.
1.01	12.50	77	.02	0.00	.02	0.	1.02	13.50	227	.39	.38	.01	427.
1.01	13.00	78	.02	0.00	.02	0.	1.02	14.00	228	.39	.38	.01	434.
1.01	13.10	79	.03	0.00	.03	0.	1.02	14.10	229	.49	.48	.01	444.
1.01	13.20	80	.03	0.00	.03	0.	1.02	14.20	230	.49	.48	.01	466.
1.01	13.30	81	.03	0.00	.03	0.	1.02	14.30	231	.49	.48	.01	494.
1.01	13.40	82	.03	0.00	.03	0.	1.02	14.40	232	.49	.48	.01	519.
1.01	13.50	83	.03	0.00	.03	0.	1.02	14.50	233	.49	.48	.01	535.
1.01	14.00	84	.03	0.00	.03	0.	1.02	15.00	234	.49	.48	.01	544.
1.01	14.10	85	.03	0.00	.03	0.	1.02	15.10	235	.45	.44	.01	547.
1.01	14.20	86	.03	0.00	.03	0.	1.02	15.20	236	.74	.73	.01	559.
1.01	14.30	87	.03	0.00	.03	0.	1.02	15.30	237	1.34	1.33	.01	643.
1.01	14.40	88	.03	0.00	.03	0.	1.02	15.40	238	3.34	3.33	.01	953.
1.01	14.50	89	.03	0.00	.03	0.	1.02	15.50	239	.97	.96	.01	1443.
1.01	15.00	90	.03	0.00	.03	0.	1.02	16.00	240	.59	.59	.01	1690.
1.01	15.10	91	.03	0.00	.03	0.	1.02	16.10	241	.46	.45	.01	1558.
1.01	15.20	92	.05	0.00	.05	0.	1.02	16.20	242	.46	.45	.01	1234.
1.01	15.30	93	.09	0.00	.09	0.	1.02	16.30	243	.46	.45	.01	952.
1.01	15.40	94	.23	.07	.15	4.	1.02	16.40	244	.46	.45	.01	781.
1.01	15.50	95	.07	.06	.01	18.	1.02	16.50	245	.46	.45	.01	675.
1.01	16.00	96	.04	.03	.01	34.	1.02	17.00	246	.46	.45	.01	612.
1.01	16.10	97	.03	.02	.01	41.	1.02	17.10	247	.36	.35	.01	568.
1.01	16.20	98	.03	.02	.01	40.	1.02	17.20	248	.36	.35	.01	527.
1.01	16.30	99	.03	.02	.01	35.	1.02	17.30	249	.36	.35	.01	487.
1.01	16.40	100	.03	.02	.01	32.	1.02	17.40	250	.36	.35	.01	455.
1.01	16.50	101	.03	.02	.01	30.	1.02	17.50	251	.36	.35	.01	435.
1.01	17.00	102	.03	.02	.01	28.	1.02	18.00	252	.36	.35	.01	422.
1.01	17.10	103	.02	.02	.01	27.	1.02	18.10	253	.03	.02	.01	395.
1.01	17.20	104	.02	.02	.01	25.	1.02	18.20	254	.03	.02	.01	326.
1.01	17.30	105	.02	.02	.01	23.	1.02	18.30	255	.03	.02	.01	232.

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1.01	17.50	107	.02	.02	.01	20.	1.02	18.50	257	.03	.02	.01	44.
1.01	18.00	108	.02	.02	.01	19.	1.02	19.00	258	.03	.02	.01	82.
1.01	18.10	109	.00	0.00	.00	18.	1.02	19.10	259	.03	.02	.01	76.
1.01	18.20	110	.00	0.00	.00	15.	1.02	19.20	260	.03	.02	.01	71.
1.01	18.30	111	.00	0.00	.00	10.	1.02	19.30	261	.03	.02	.01	66.
1.01	18.40	112	.00	0.00	.00	6.	1.02	19.40	262	.03	.02	.01	62.
1.01	18.50	113	.00	0.00	.00	4.	1.02	19.50	263	.03	.02	.01	58.
1.01	19.00	114	.00	0.00	.00	2.	1.02	20.00	264	.03	.02	.01	54.
1.01	19.10	115	.00	0.00	.00	2.	1.02	20.10	265	.03	.02	.01	50.
1.01	19.20	116	.00	0.00	.00	2.	1.02	20.20	266	.03	.02	.01	47.
1.01	19.30	117	.00	0.00	.00	2.	1.02	20.30	267	.03	.02	.01	44.
1.01	19.40	118	.00	0.00	.00	2.	1.02	20.40	268	.03	.02	.01	41.
1.01	19.50	119	.00	0.00	.00	1.	1.02	20.50	269	.03	.02	.01	38.
1.01	20.00	120	.00	0.00	.00	1.	1.02	21.00	270	.03	.02	.01	35.
1.01	20.10	121	.00	0.00	.00	1.	1.02	21.10	271	.03	.02	.01	33.
1.01	20.20	122	.00	0.00	.00	1.	1.02	21.20	272	.03	.02	.01	31.
1.01	20.30	123	.00	0.00	.00	1.	1.02	21.30	273	.03	.02	.01	29.
1.01	20.40	124	.00	0.00	.00	1.	1.02	21.40	274	.03	.02	.01	27.
1.01	20.50	125	.00	0.00	.00	1.	1.02	21.50	275	.03	.02	.01	25.
1.01	21.00	126	.00	0.00	.00	1.	1.02	22.00	276	.03	.02	.01	24.
1.01	21.10	127	.00	0.00	.00	1.	1.02	22.10	277	.03	.02	.01	24.
1.01	21.20	128	.00	0.00	.00	1.	1.02	22.20	278	.03	.02	.01	24.
1.01	21.30	129	.00	0.00	.00	1.	1.02	22.30	279	.03	.02	.01	24.
1.01	21.40	130	.00	0.00	.00	1.	1.02	22.40	280	.03	.02	.01	24.
1.01	21.50	131	.00	0.00	.00	1.	1.02	22.50	281	.03	.02	.01	24.
1.01	22.00	132	.00	0.00	.00	1.	1.02	23.00	282	.03	.02	.01	24.
1.01	22.10	133	.00	0.00	.00	1.	1.02	23.10	283	.03	.02	.01	24.
1.01	22.20	134	.00	0.00	.00	1.	1.02	23.20	284	.03	.02	.01	24.
1.01	22.30	135	.00	0.00	.00	0.	1.02	23.30	285	.03	.02	.01	24.
1.01	22.40	136	.00	0.00	.00	0.	1.02	23.40	286	.03	.02	.01	24.
1.01	22.50	137	.00	0.00	.00	0.	1.02	23.50	287	.03	.02	.01	24.
1.01	23.00	138	.00	0.00	.00	0.	1.03	0.00	288	.03	.02	.01	24.
1.01	23.10	139	.00	0.00	.00	0.	1.03	.10	289	0.00	0.00	0.00	23.
1.01	23.20	140	.00	0.00	.00	0.	1.03	.20	290	0.00	0.00	0.00	22.
1.01	23.30	141	.00	0.00	.00	0.	1.03	.30	291	0.00	0.00	0.00	20.
1.01	23.40	142	.00	0.00	.00	0.	1.03	.40	292	0.00	0.00	0.00	19.
1.01	23.50	143	.00	0.00	.00	0.	1.03	.50	293	0.00	0.00	0.00	18.
1.02	0.00	144	.00	0.00	.00	0.	1.03	1.00	294	0.00	0.00	0.00	16.
1.02	.10	145	.02	.01	.01	1.	1.03	1.10	295	0.00	0.00	0.00	15.
1.02	.20	146	.02	.01	.01	3.	1.03	1.20	296	0.00	0.00	0.00	14.
1.02	.30	147	.02	.01	.01	6.	1.03	1.30	297	0.00	0.00	0.00	13.
1.02	.40	148	.02	.01	.01	9.	1.03	1.40	298	0.00	0.00	0.00	12.
1.02	.50	149	.02	.01	.01	11.	1.03	1.50	299	0.00	0.00	0.00	12.
1.02	1.00	150	.02	.01	.01	12.	1.03	2.00	300	0.00	0.00	0.00	11.
									SUM	24.99	22.60	2.39	26689.
										(635.)	(574.)	(61.)	(755.75)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1690.	605.	181.	89.	26707.
CMS	48.	17.	5.	3.	756.
INCHES		18.76	22.49	23.00	23.00
MM		476.59	571.34	584.29	584.29
AC-FT		300.	360.	368.	368.
THOUS CU M		370.	444.	454.	454.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	253.	91.	27.	13.	4006.
CMS	7.	3.	1.	0.	113.
INCHES		2.81	3.37	3.45	3.45
MM		71.49	85.70	87.64	87.64
AC-FT		45.	54.	55.	55.
THOUS CU M		56.	67.	68.	68.

PLAN 2 SAME AS PLAN 1

Sh 40

COMBINE HYDROGRAPHS

COMBINE INFLOW AND BEARFORT WATERS OUTFLOW

UNITED COMPUTING SYSTEMS, INC.

	ISTAQ	IGOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	COMBIN	2	0	0	0	0	1	0	0

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	778.	300.	98.	48.	14366.
CMS	22.	8.	3.	1.	407.
INCHES		1.99	2.62	2.65	2.65
MM		50.62	66.49	67.35	67.35
AC-FT		149.	195.	198.	198.
THOUS CU M		183.	241.	244.	244.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 2 RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	778.	300.	98.	48.	14366.
CMS	22.	8.	3.	1.	407.
INCHES		1.99	2.62	2.65	2.65
MM		50.62	66.49	67.35	67.35
AC-FT		149.	195.	198.	198.
THOUS CU M		183.	241.	244.	244.

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HYDROGRAPH ROUTING

OUTFLOW FROM LOOKOVER LAKE DAM

	ISTAQ	IGOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	OUTFLO	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1119.	-1

STAGE	1118.50	1119.00	1119.50	1120.50	1121.50	1123.50	1128.50	1133.50
FLOW	0.00	8.00	22.00	518.00	1457.00	4357.00	17214.00	38751.00
SURFACE AREA=	0.	13.	31.	57.				
CAPACITY=	0.	39.	498.	1365.				
ELEVATION=	1110.	1119.	1140.	1160.				

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1118.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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DAM DATA

TOPEL	COQD	EXPD	DAMWID
1119.5	0.0	0.0	0.

DAM BREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILFL

UNITED COMPUTING SYSTEMS, INC.

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                                   STATION OUTFLO, PLAN 1, RATIO 1

                                   END-OF-PERIOD HYDROGRAPH ORDINATES

                                            OUTFLOW
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        2.        2.        2.
         2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
         2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
         2.        2.        2.        2.        2.        2.        2.        3.        3.        3.
         3.        3.        3.        3.        3.        3.        3.        3.        4.        4.
         4.        4.        4.        4.        4.        5.        5.        5.        5.        5.
         5.        6.        6.        6.        6.        6.        6.        7.        7.        7.
         7.        7.        7.        8.        8.        8.        8.        9.        9.       10.
        12.       13.       15.       16.       18.       20.       21.       41.       62.       77.
        88.       98.      106.      113.      119.      124.      131.      149.      201.      292.
       416.      559.      683.      695.      655.      596.      539.      499.      468.      435.
       404.      378.      357.      339.      318.      294.      266.      239.      213.      190.
       169.      151.      135.      120.      108.       97.       87.       79.       73.       69.
        67.       65.       63.       62.       61.       60.       60.       59.       59.       58.
        58.       57.       57.       56.       56.       55.       55.       54.       54.       53.
        53.       52.       52.       51.       50.       50.       49.       49.       48.       47.

                                            STORAGE
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
        39.       40.       40.       40.       40.       40.       40.       40.       40.       40.
        40.       40.       40.       40.       40.       40.       40.       40.       40.       40.
        40.       40.       40.       40.       40.       40.       40.       40.       40.       40.
        40.       40.       40.       40.       40.       40.       40.       40.       40.       40.
        40.       40.       40.       40.       40.       40.       40.       40.       40.       40.
        40.       40.       40.       40.       40.       40.       40.       40.       41.       41.
        41.       41.       41.       41.       41.       41.       41.       41.       41.       41.
        41.       41.       41.       41.       41.       41.       41.       41.       41.       41.
        41.       41.       41.       41.       41.       42.       42.       42.       42.       42.
        42.       42.       42.       43.       43.       43.       43.       43.       43.       43.
        43.       44.       44.       44.       44.       44.       44.       44.       45.       45.
        45.       45.       45.       45.       45.       46.       46.       46.       46.       47.
        47.       48.       49.       49.       50.       51.       52.       53.       53.       54.
        54.       54.       55.       55.       55.       55.       55.       56.       57.       60.
        63.       67.       69.       69.       68.       68.       67.       66.       65.       64.
        63.       62.       62.       61.       61.       60.       59.       58.       58.       57.
        56.       56.       55.       55.       55.       54.       54.       54.       54.       54.
        54.       54.       53.       53.       53.       53.       53.       53.       53.       53.
        53.       53.       53.       53.       53.       53.       53.       53.       53.       53.
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UNITED COMPUTING SYSTEMS, INC.

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                                                  STAGE
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
           1118.5    1118.5    1118.5    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
           1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
           1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
           1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
           1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
           1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
           1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
           1118.6    1118.6    1118.6    1118.6    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7
           1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7
           1118.7    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8
           1118.8    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9
           1118.9    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.1
           1119.1    1119.2    1119.2    1119.3    1119.3    1119.4    1119.5    1119.5    1119.6    1119.6
           1119.6    1119.7    1119.7    1119.7    1119.7    1119.7    1119.7    1119.8    1119.9    1120.0
           1120.3    1120.5    1120.7    1120.7    1120.6    1120.6    1120.5    1120.5    1120.4    1120.3
           1120.3    1120.2    1120.2    1120.1    1120.1    1120.0    1120.0    1119.9    1119.9    1119.8
           1119.8    1119.8    1119.7    1119.7    1119.7    1119.7    1119.6    1119.6    1119.6    1119.6
           1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6
           1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6
           1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6    1119.6

   PEAK OUTFLOW IS      695. AT TIME  40.67 HOURS

                             PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                    CFS      695.     299.       92.       44.        13347.
                    CMS       20.       8.        3.        1.          378.
                 INCHES               1.98      2.45      2.46         2.46
                     MM              50.38     62.21     62.57        62.57
                  AC-FT               148.      183.      184.         184.
              THOUS CU M              183.      225.      227.         227.


                                      DAM BREACH DATA
                             BRWID        Z    ELBM    TFAIL     WSEL  FAILEL
                              100.     1.00 1113.00      .17  1118.50 1120.50

                                 STATION OUTFLO, PLAN 2, RATIO 1

   BEGIN DAM FAILURE AT 40.33 HOURS
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                              END-OF-PERIOD HYDROGRAPH ORDINATES

                                          OUTFLOW
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        1.
      1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
      1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
      1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
      1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
      1.        1.        1.        1.        1.        1.        1.        2.        2.        2.
      2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
      2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
      2.        2.        2.        2.        2.        2.        2.        3.        3.        3.
      3.        3.        3.        3.        3.        3.        3.        3.        4.        4.
      4.        4.        4.        4.        4.        5.        5.        5.        5.        5.
      5.        6.        6.        6.        6.        6.        6.        7.        7.        7.
      7.        7.        7.        8.        8.        8.        8.        9.        9.       10.
     12.       13.       15.       16.       18.       20.       21.       41.       62.       77.
     88.       98.      106.      113.      119.      124.      131.      149.      201.      292.
    416.      561.     4259.     1552.      669.      561.      504.      457.      417.      383.
    356.      336.      325.      309.      285.      255.      224.      196.      174.      155.
    138.      123.      111.       99.       89.       81.       73.       68.       65.       64.
     63.       62.       62.       61.       60.       59.       59.       58.       58.       57.
     57.       56.       56.       56.       55.       55.       54.       54.       53.       53.
     52.       51.       51.       50.       50.       49.       48.       48.       47.       47.

                                          STORAGE
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       39.       39.       39.       39.       39.       39.       39.       39.       39.
     39.       40.       40.       40.       40.       40.       40.       40.       40.       40.
     40.       40.       40.       40.       40.       40.       40.       40.       40.       40.
     40.       40.       40.       40.       40.       40.       40.       40.       40.       40.
     40.       40.       40.       40.       40.       40.       40.       40.       40.       40.
     40.       40.       40.       40.       40.       40.       40.       40.       40.       40.
     40.       40.       40.       40.       40.       40.       40.       40.       41.       41.
     41.       41.       41.       41.       41.       41.       41.       41.       41.       41.
     41.       41.       41.       41.       41.       41.       41.       41.       41.       41.
     41.       41.       41.       41.       41.       42.       42.       42.       42.       42.
     42.       42.       42.       43.       43.       43.       43.       43.       43.       43.
     43.       44.       44.       44.       44.       44.       44.       44.       45.       45.
     45.       45.       45.       45.       45.       46.       46.       46.       46.       47.
     47.       48.       49.       49.       50.       51.       52.       53.       53.       54.
     54.       54.       55.       55.       55.       55.       55.       56.       57.       60.
     63.       67.       42.       14.        7.        7.        6.        6.        6.        5.
      5.        5.        5.        5.        5.        4.        4.        4.        4.        4.
      4.        4.        3.        3.        3.        3.        3.        3.        3.        3.
      3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
      3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
      3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
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UNITED COMPUTING SYSTEMS, INC.

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                                                        STAGE
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5    1118.5
        1118.5    1118.5    1118.5    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
        1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
        1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
        1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
        1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
        1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
        1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6    1118.6
        1118.6    1118.6    1118.6    1118.6    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7
        1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7    1118.7
        1118.7    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8    1118.8
        1118.8    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9    1118.9
        1118.9    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.0    1119.1
        1119.1    1119.2    1119.2    1119.3    1119.3    1119.4    1119.5    1119.5    1119.6    1119.6
        1119.6    1119.7    1119.7    1119.7    1119.7    1119.7    1119.7    1119.8    1119.9    1120.0
        1120.3    1120.5    1118.7    1115.9    1114.7    1114.5    1114.4    1114.3    1114.2    1114.2
        1114.1    1114.1    1114.0    1114.0    1113.9    1113.9    1113.8    1113.7    1113.7    1113.6
        1113.6    1113.5    1113.5    1113.5    1113.4    1113.4    1113.4    1113.4    1113.4    1113.3
        1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3
        1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3
        1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3    1113.3

  PEAK OUTFLOW IS      4318. AT TIME  40.50 HOURS

                                   PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                          CFS     4259.     402.      117.       87.       16992.
                          CMS      121.      11.        3.        2.         481.
                       INCHES               2.67      3.12      3.14         3.14
                           MM              67.78     79.30     79.66        79.66
                        AC-FT               199.      233.      234.         234.
                    THOUS CU M              246.      287.      289.         289.
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THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF .003 HOURS DURING BREACH FORMATION.
DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF .167 HOURS.
THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	COMPUTED BREACH HYDROGRAPH (CFS)	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
40.333	0.000	561.	561.	0.	0.	0.
40.337	.003	637.	954.	-317.	-317.	-0.
40.340	.007	712.	1016.	-304.	-621.	-0.
40.344	.010	787.	1079.	-292.	-913.	-0.
40.347	.014	863.	1144.	-281.	-1194.	-0.
40.350	.017	938.	1210.	-271.	-1465.	-0.
40.354	.020	1014.	1276.	-262.	-1728.	-0.
40.357	.024	1089.	1343.	-254.	-1982.	-1.
40.361	.027	1165.	1416.	-251.	-2233.	-1.
40.364	.031	1240.	1489.	-249.	-2482.	-1.
40.367	.034	1316.	1563.	-248.	-2730.	-1.
40.371	.037	1391.	1638.	-247.	-2976.	-1.
40.374	.041	1467.	1712.	-246.	-3222.	-1.
40.378	.044	1542.	1787.	-245.	-3467.	-1.
40.381	.048	1618.	1862.	-244.	-3712.	-1.
40.384	.051	1693.	1937.	-244.	-3955.	-1.
40.388	.054	1769.	2011.	-242.	-4198.	-1.
40.391	.058	1844.	2085.	-241.	-4439.	-1.
40.395	.061	1919.	2159.	-239.	-4678.	-1.
40.398	.065	1995.	2232.	-237.	-4915.	-1.
40.401	.068	2070.	2305.	-234.	-5150.	-1.
40.405	.071	2146.	2377.	-231.	-5381.	-2.
40.408	.075	2221.	2448.	-227.	-5607.	-2.
40.412	.078	2297.	2519.	-222.	-5829.	-2.
40.415	.082	2372.	2588.	-216.	-6045.	-2.
40.418	.085	2448.	2657.	-209.	-6255.	-2.
40.422	.088	2523.	2725.	-202.	-6457.	-2.
40.425	.092	2599.	2792.	-193.	-6650.	-2.
40.429	.095	2674.	2858.	-184.	-6834.	-2.
40.432	.099	2750.	2923.	-173.	-7007.	-2.
40.435	.102	2825.	2986.	-161.	-7168.	-2.
40.439	.105	2901.	3049.	-148.	-7316.	-2.
40.442	.109	2976.	3110.	-134.	-7451.	-2.
40.446	.112	3051.	3170.	-119.	-7570.	-2.
40.449	.116	3127.	3229.	-102.	-7672.	-2.
40.452	.119	3202.	3287.	-85.	-7756.	-2.
40.456	.122	3278.	3343.	-65.	-7822.	-2.
40.459	.126	3353.	3398.	-45.	-7867.	-2.
40.463	.129	3429.	3477.	-49.	-7916.	-2.
40.466	.133	3504.	3555.	-51.	-7967.	-2.
40.469	.136	3580.	3632.	-52.	-8019.	-2.
40.473	.139	3655.	3707.	-52.	-8071.	-2.
40.476	.143	3731.	3781.	-50.	-8121.	-2.
40.480	.146	3806.	3854.	-47.	-8169.	-2.
40.483	.150	3882.	3924.	-43.	-8212.	-2.
40.486	.153	3957.	3994.	-37.	-8248.	-2.
40.490	.156	4033.	4062.	-30.	-8278.	-2.
40.493	.160	4108.	4129.	-21.	-8299.	-2.
40.497	.163	4184.	4195.	-12.	-8311.	-2.
40.500	.167	4259.	4259.	0.	-8311.	-2.

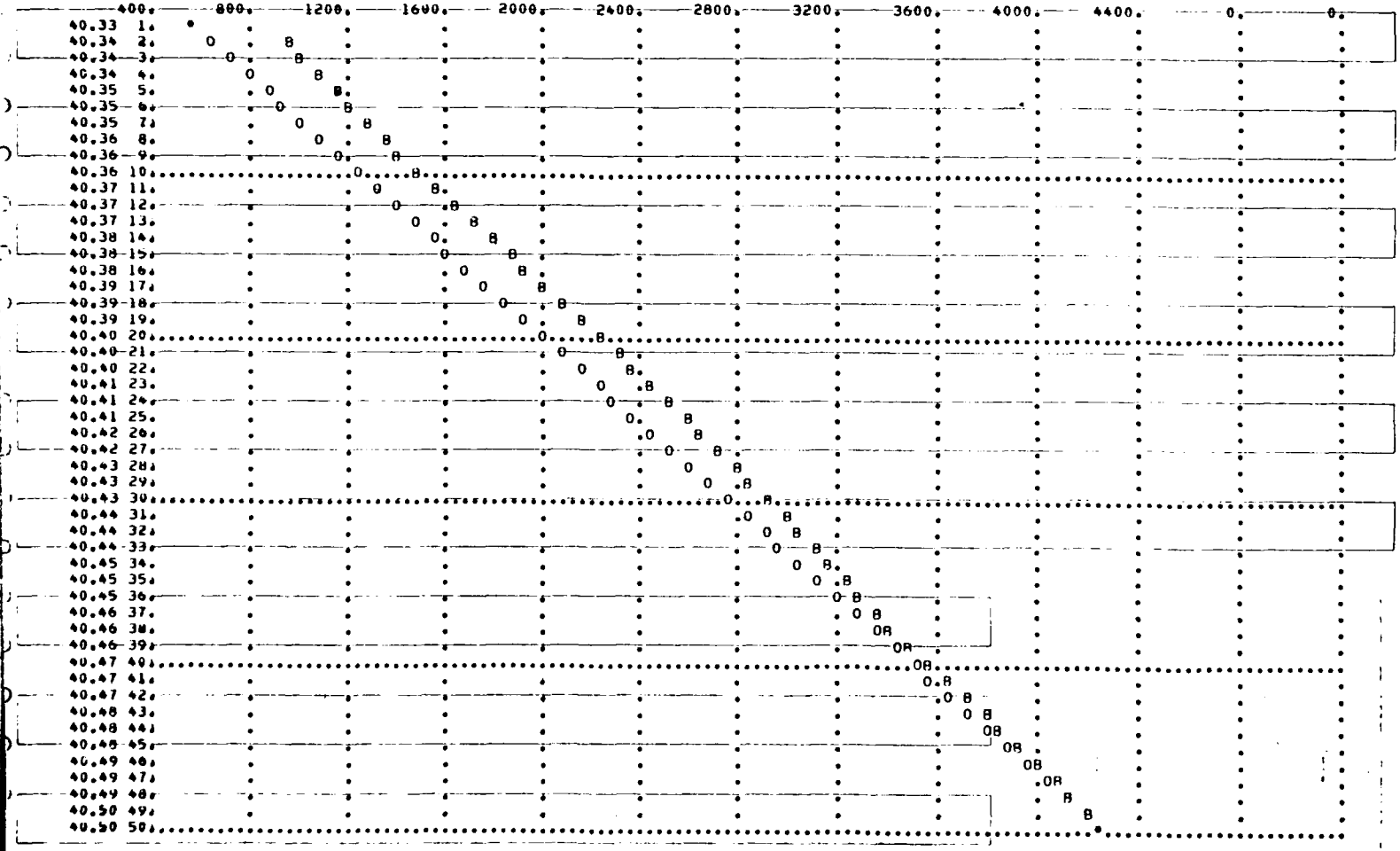
Sh 46

OVER

STATIONOUTFLO

TIME (HRS)

(O) INTERPOLATED BREACH HYDROGRAPH
(B) COMPUTED BREACH HYDROGRAPH
(*) POINTS AT NORMAL TIME INTERVAL



Sh 47

HYDROGRAPH-ROUTING

ROUTING BREACH FLOOD TO DOWNSTREAM DAMAGE CENTER

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
HAZARD	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0600	.0400	.0600	1105.0	1120.0	1000.	.00500

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 1120.00 50.00 1114.00 100.00 1108.00 107.00 1105.00 113.00 1105.00
120.00 1108.00 160.00 1114.00 200.00 1120.00

STORAGE	0.00	.24	.35	.63	.97	1.48	2.21	3.15	4.31	5.68
	7.27	9.07	11.08	13.31	15.76	18.42	21.29	24.38	27.68	31.20
OUTFLOW	0.00	11.84	42.68	94.83	175.48	305.23	481.36	713.11	1008.45	1374.71
	1818.74	2347.08	2965.96	3681.42	4499.26	5425.15	6464.57	7622.91	8905.38	10317.13
STAGE	1105.00	1105.79	1106.58	1107.37	1108.16	1108.95	1109.74	1110.53	1111.32	1112.11
	1112.89	1113.68	1114.47	1115.26	1116.05	1116.84	1117.63	1118.42	1119.21	1120.00
FLOW	0.00	11.84	42.68	94.83	175.48	305.23	481.36	713.11	1008.45	1374.71
	1818.74	2347.08	2965.96	3681.42	4499.26	5425.15	6464.57	7622.91	8905.38	10317.13

STATION HAZARD, PLAN 1, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	699.	298.	92.	44.	13320.
CMS	20.	8.	3.	1.	377.
INCHES		1.98	2.44	2.46	2.46
MM		50.37	62.08	62.44	62.44
AC-FT		148.	182.	183.	183.
THOUS CU M		183.	225.	226.	226.

MAXIMUM STORAGE = 3.

MAXIMUM STAGE IS 1110.5

UNITED COMPUTING SYSTEMS, INC.

STATION HAZARD, PLAN 2, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3014.	402.	117.	57.	16965.
CMS	85.	11.	3.	2.	480.
INCHES		2.67	3.12	3.13	3.13
MM		67.76	79.18	79.53	79.53
AC-FT		199.	233.	234.	234.
THOUS CU M		246.	287.	288.	288.

MAXIMUM STORAGE = 11.

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MAXIMUM STAGE IS 1114.5

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1130.00	1130.00	1132.50
STORAGE	93.	93.	170.
OUTFLOW	0.	0.	59.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.15	1133.26	.76	197.	596.	4.83	40.50	0.00

PLAN 2

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1130.00	1130.00	1132.50
STORAGE	93.	93.	170.
OUTFLOW	0.	0.	59.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.15	1133.26	.76	197.	596.	4.83	40.50	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1118.50	1118.50	1119.50
STORAGE	39.	39.	52.
OUTFLOW	0.	0.	22.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.15	1120.69	1.19	69.	695.	12.17	40.67	0.00

PLAN 2

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1118.50	1118.50	1119.50
STORAGE	39.	39.	52.
OUTFLOW	0.	0.	22.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.15	1120.54	1.04	67.	4318.	2.63	40.50	40.33

PLAN 1 STATION HAZARD

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.15	699.	1110.5	40.67

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PLAN 2 STATION HAZARD

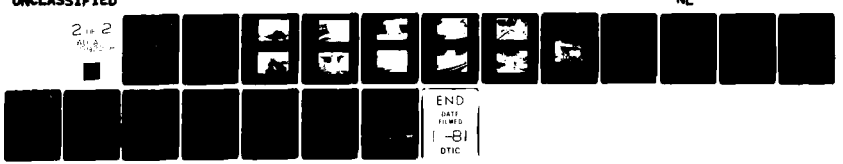
	MAXIMUM	MAXIMUM	TIME

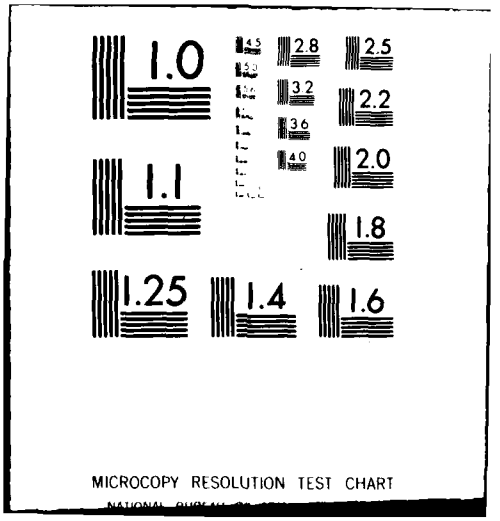
APPENDIX

D

Photographs

AD-A092 218 O'BRIEN AND GERE ENGINEERS INC PHILADELPHIA PA F/G 13/13
NATIONAL DAM SAFETY PROGRAM. LOOKOVER LAKE DAM (NJ00565), HUDSO--ETC(U)
SEP 80 J J WILLIAMS DACW61-80-P-0013
UNCLASSIFIED NL




1.0
1.1
1.25
1.4
1.6
1.8
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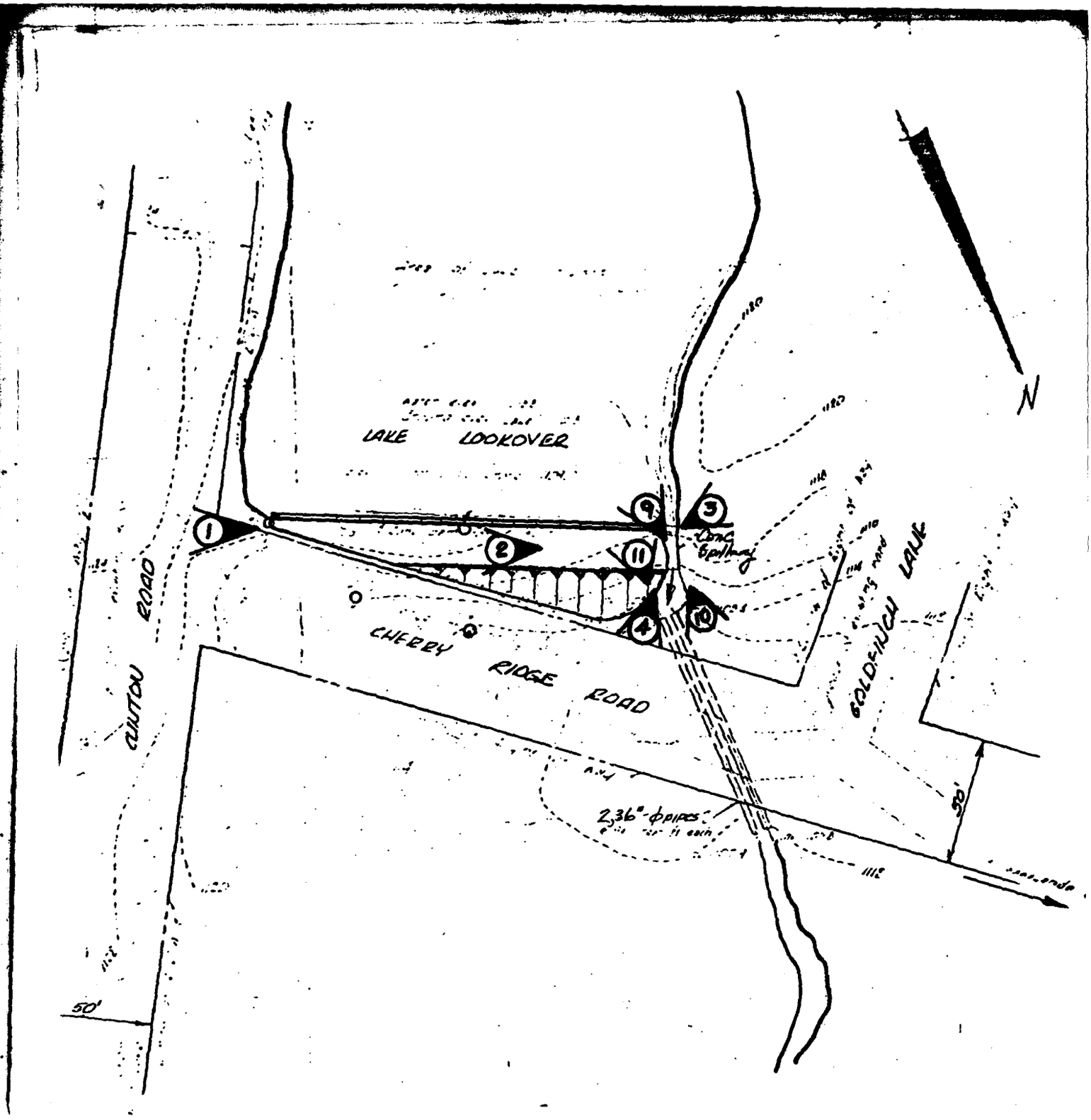
2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART

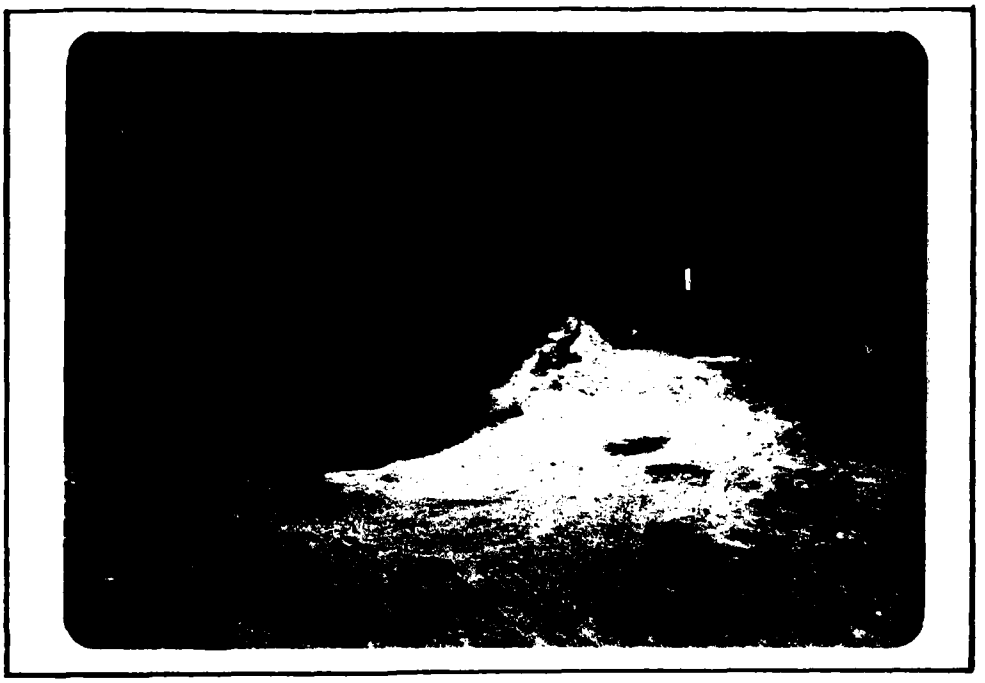


LEGEND

(1) THE LOCATION AND DIRECTION IN WHICH EACH PHOTO WAS TAKEN AND THE NUMBER OF THE PHOTO

PAGE A

APPENDIX D
SELECTED PHOTOGRAPHS OF THE SITE



1. VIEW ALONG THE TOP OF THE DAM AS OBSERVED FROM THE RIGHT ABUTMENT. (5/28/80)

2. VIEW FROM ABOUT THE LONGITUDINAL MID POINT OF THE DAM SHOWING THE SPILLWAY IN THE BACKGROUND ADJACENT TO THE LEFT ABUTMENT. (5/28/80)

3. VIEW ALONG THE TOP OF THE DAM FROM THE LEFT ABUTMENT WITH THE SPILLWAY IN THE FOREGROUND. (5/28/80)

4. LOOKING UPSTREAM AT THE SPILLWAY WITH A CRUSHED STONE STILLING BASIN IN THE FOREGROUND. (5/28/80)

7. SPILLWAY SYSTEM FOR BEARFORT WATER APPROXIMATELY 2,000 FT. UPSTREAM OF LOOKOVER LAKE DAM. (5/28/80)

8. DAMAGE AREA ABOUT 800 FT. DOWNSTREAM OF THE DAM. (5/28/80)

9. DAMAGE AREA ABOUT 900 FEET DOWNSTREAM OF THE DAM. (5/28/80)

10. CLINTON MOTEL DAMAGE AREA ABOUT 2,200 FEET DOWNSTREAM OF THE DAM. (5/28/80)

9. EROSION AROUND RIGHT SPILLWAY ABUTMENT DUE TO OVERTOPPING. (3/24/80)

10. EROSION IN VICINITY OF SPILLWAY DUE TO OVERTOPPING. (3/24/80)

11. ROCKS PARTIALLY BLOCKING CULVERTS BENEATH CHERRY RIDGE ROAD. (5/28/80)

APPENDIX

E

Drawings

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
Lookover Lake Dam, Phila COE, Open End				

APPENDIX E
TABLE OF CONTENTS
DRAWINGS

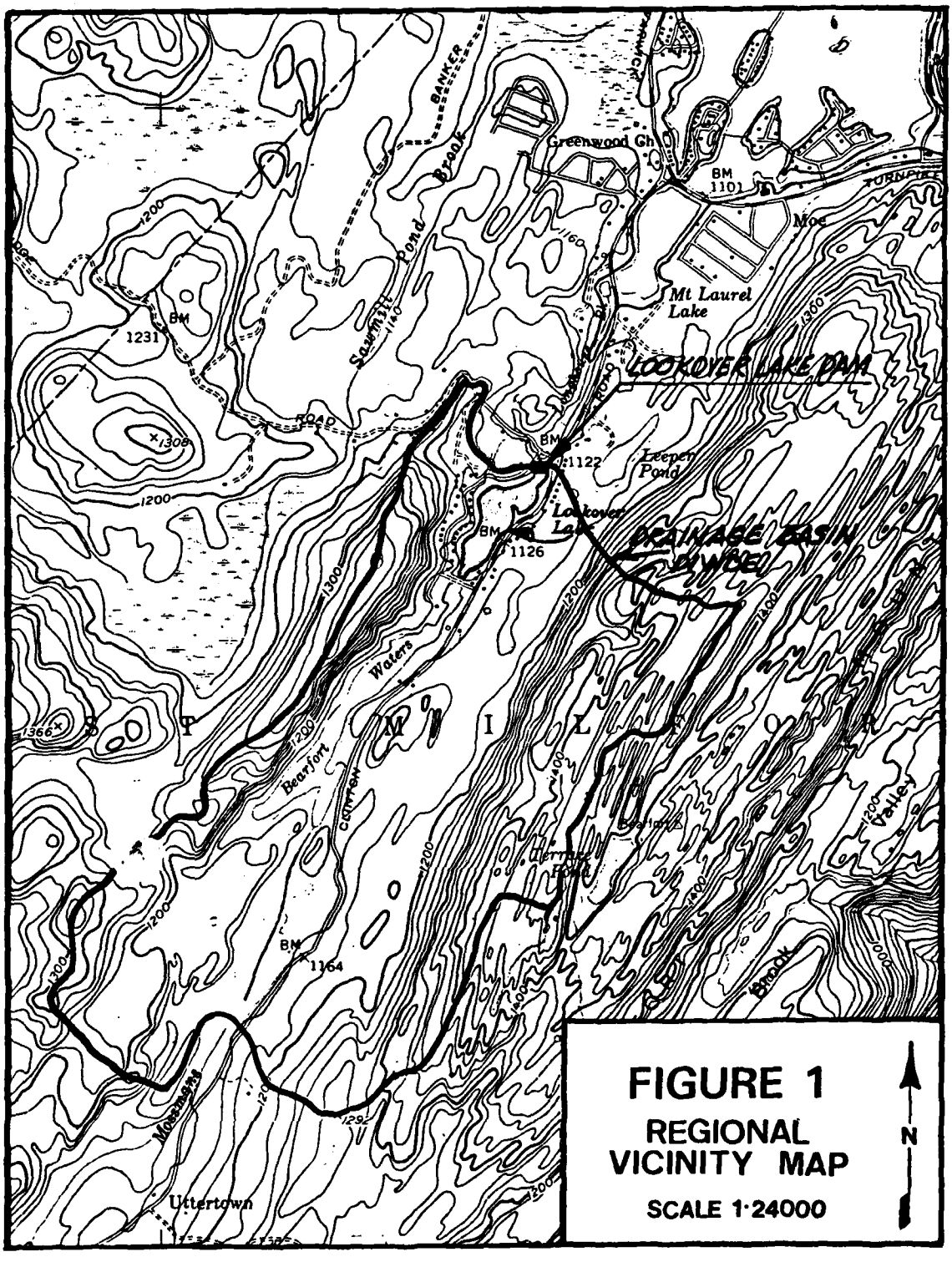
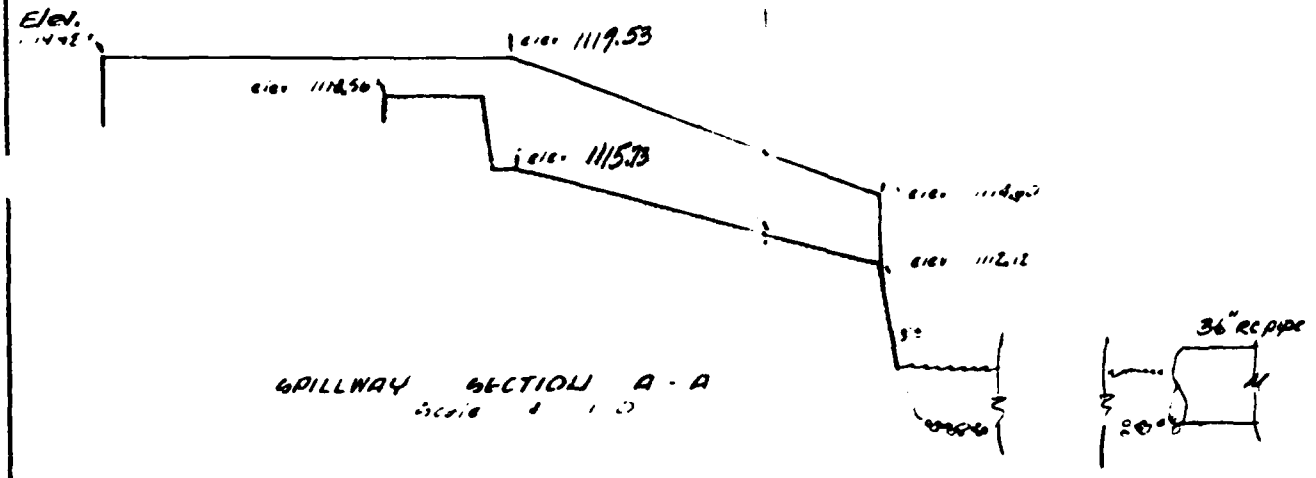


FIGURE 1

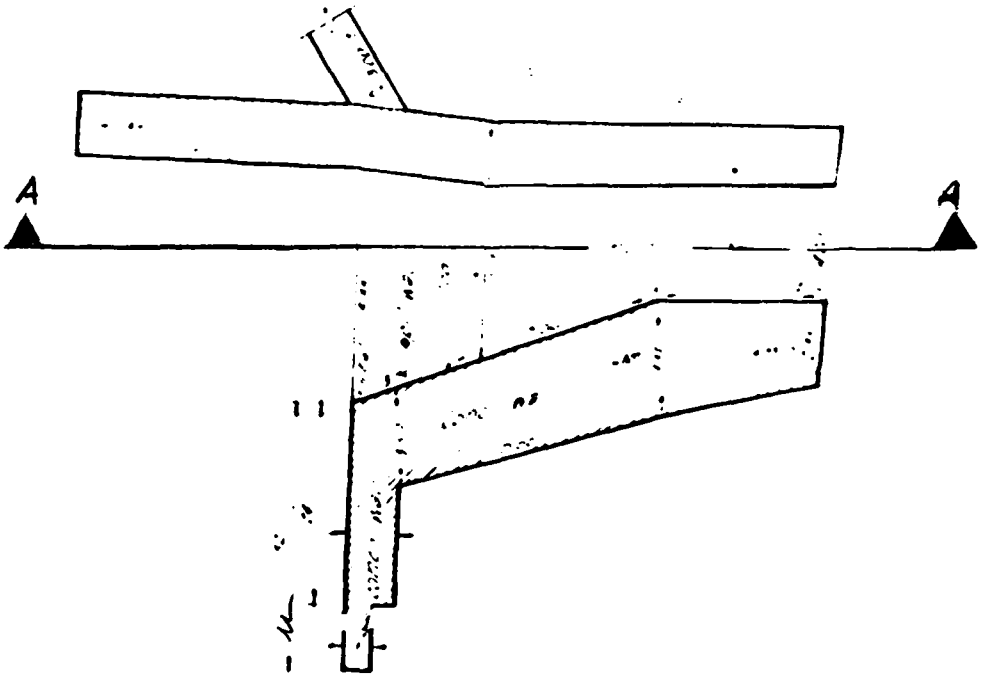
REGIONAL VICINITY MAP

SCALE 1·24000

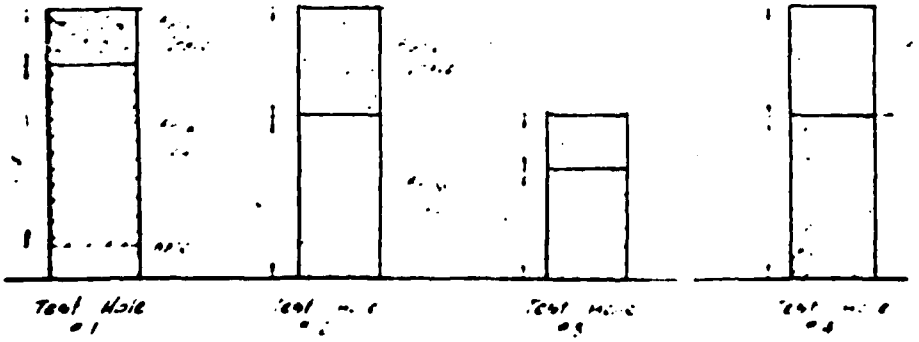
N



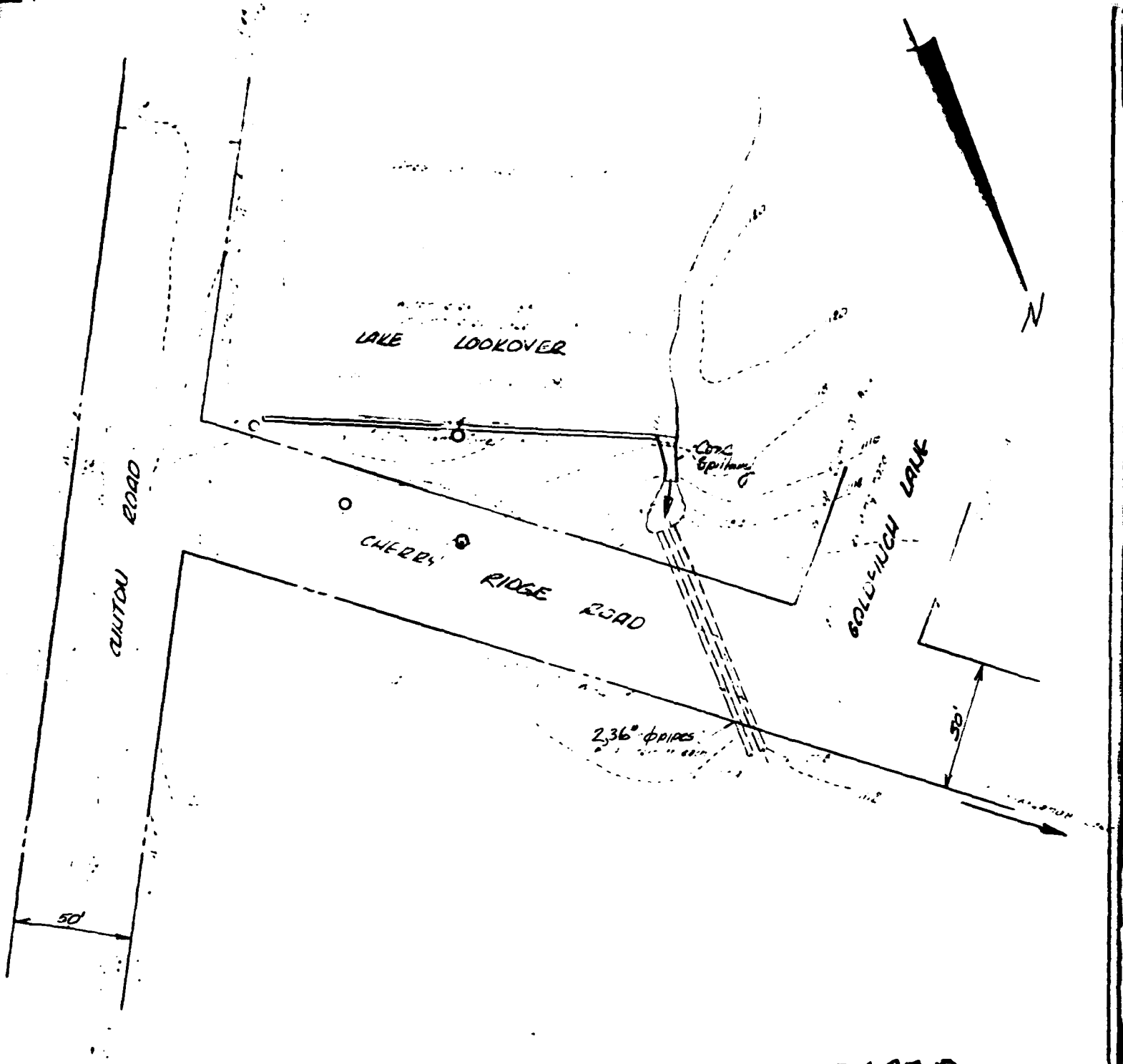
SPILLWAY SECTION A - A
Scale 1" = 10'



DAM SPILLWAY PLAN



Soil Log Test

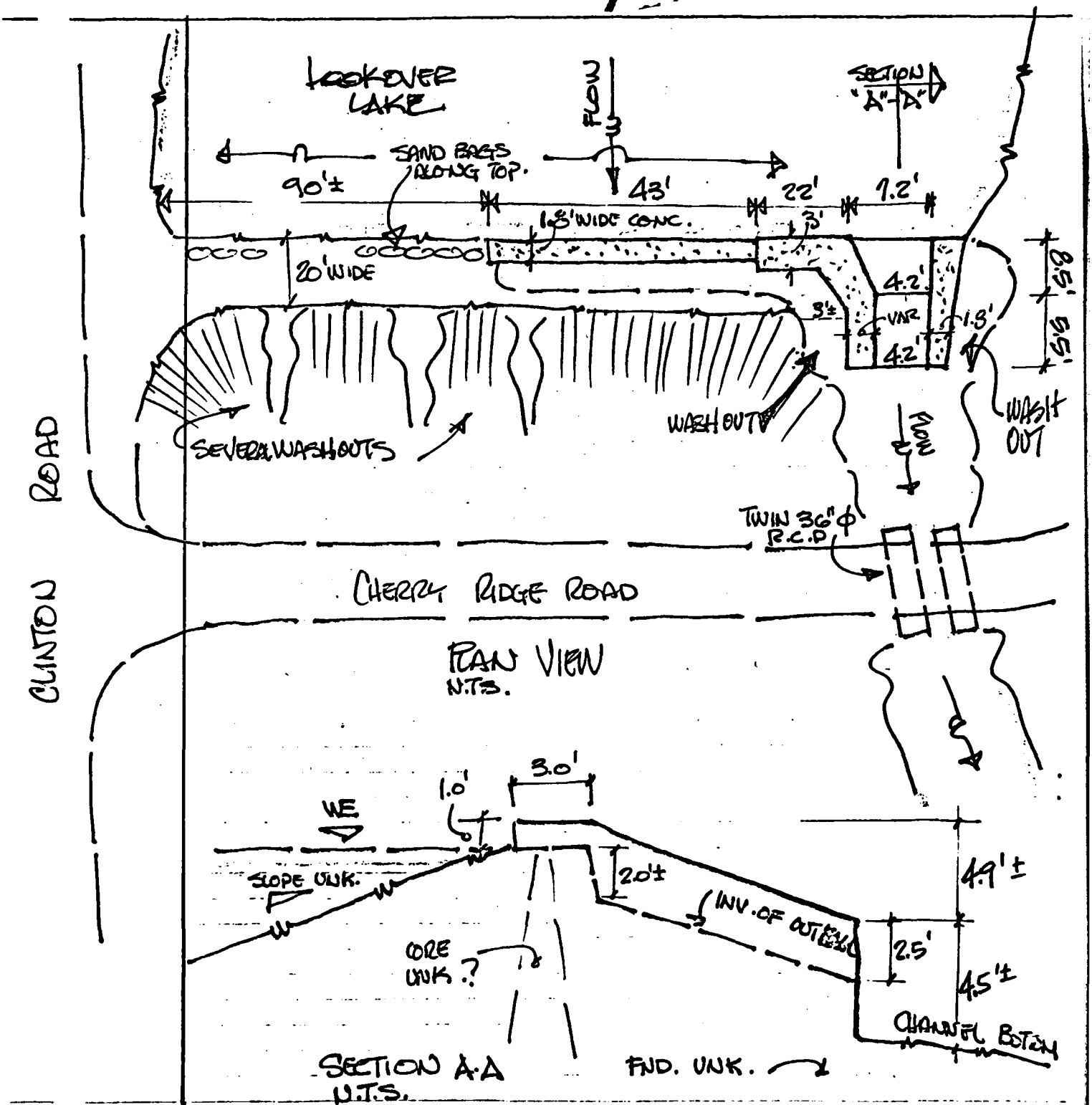


PAGE 2

Dam Site Investigation
LAKE LOOKOVER

CONDITION OF LOOKOVER LAKE AS OF 3-24-80

Field Inspection NJ DEP



FILE No	INSP.	DATE	PROJECT	PAGE
	VGL JJK	3-24-80	LOOKOVER LAKE	3

USA ENGR PHIL

002037A091 0800EST

001 PHILA PA 31 MAR 80

PMS HONORABLE BRENDAN T. BYRNE

GOVERNOR OF NEW JERSEY

TRENTON NJ 08621

UNCLAS

AT THE REQUEST OF MR. JOHN O'DOWD, ACTING CHIEF, BUREAU OF FLOOD PLAIN MANAGEMENT, NJDEP, REPRESENTATIVES OF THIS OFFICE ACCOMPANIED HIM ON AN INSPECTION OF BEARFORT WATERS DAM AND LOOKOVER LAKE DAM IN PASSAIC COUNTY, NEW JERSEY, ON THE NIGHT OF 21 MARCH 1980. A FOLLOWSUP INSPECTION WAS ALSO MADE OF THE TWO DAMS ON 24 MARCH 1980 BY REPRESENTATIVES OF THIS OFFICE AND THE BUREAU OF FLOOD PLAIN MANAGEMENT. IN RESPONSE TO MR. O'DOWD'S REQUEST WE ARE HEREBY TRANSMITTING OUR RECOMMENDATIONS FOR IMMEDIATE REMEDIAL ACTIONS THAT SHOULD BE UNDERTAKEN AT THESE DAMS TO INSURE THE ADEQUACY AND SAFETY OF THE STRUCTURES:

A. LOOKOVER LAKE DAM.

1. FILL ERODED AREAS ON BOTH SIDES OF THE SPILLWAY WITH PERVIOUS MATERIAL MEETING NJDOT 1A SPECIFICATIONS.

2. DRESS UP THE ERODED DOWNSTREAM SLOPES.

3. A DETAILED EMERGENCY OPERATION PLAN AND WARNING SYSTEM SHOULD BE PROMPTLY DEVELOPED. DURING PERIODS OF UNUSUALLY HEAVY PRECIPITATION, AROUND THE CLOCK SURVEILLANCE SHOULD BE PROVIDED.

4. INSTITUTE MEASURES TO PREVENT DEBRIS AND TRASH BUILDUP ON THE SPILLWAY.

5. INVESTIGATE THE CONDITION OF THE STILLING BASIN AREA ESPECIALLY WITH REGARD TO UNDERCUTTING OF THE SPILLWAY BY SCOURING. RIPRAP THE TOE OF THE SPILLWAY, IF NEEDED.

B. BEARFORT WATERS DAM.

1. CONDUCT A HYDROLOGIC AND HYDRAULIC STUDY TO DETERMINE THE CAPACITY OF THE SPILLWAY. INSTITUTE ANY REMEDIAL MEASURES NECESSARY TO INSURE THE ADEQUACY OF THE SPILLWAY AND TO PREVENT OVERTOPPING.

2. CONDUCT A COMPLETE TOPOGRAPHIC SURVEY OF THE DAM AND SURROUNDING AREA IN ORDER TO DEVELOP A DETAILED PLAN AND SEVERAL CROSS-SECTIONS OF THE DAM.

3. REPAIR THE OUTLET STRUCTURE INCLUDING THE OVERFLOW SPILLWAY.

4. LOWER THE LAKE LEVEL 1 TO 2 FEET.

5. DRESS UP THE ERODED AREAS ON THE DOWNSTREAM SLOPES OF THE DAM.

6. UNCLOG THE DOWNSTREAM ROAD CULVERTS AND REPLACE THE EXISTING CULVERTS WITH ONES OF THE PROPER SIZE.

7. A DETAILED EMERGENCY OPERATION PLAN AND DOWNSTREAM WARNING SYSTEM SHOULD BE PROMPTLY DEVELOPED. DURING PERIOD OF UNUSUALLY HEAVY PRECIPITATION, AROUND THE CLOCK SURVEILLANCE SHOULD BE PROVIDED.

8. DEFINE THE DRAINAGE AREA DIVIDE.

9. INVESTIGATE THE EXISTENCE OF A LOW LEVEL OUTLET AND, IF PRESENT, MAKE IT OPERATIONAL. IN ADDITION, LOOKOVER LAKE DAM WILL BE INSPECTED AGAIN IN THE NEAR FUTURE UNDER THE NON-FEDERAL DAM INSPECTION PROGRAM. MR. O'DOWD HAS SENT A LETTER TO THE OWNER OF LOOKOVER LAKE DAM REQUESTING THE IMMEDIATE REMEDIAL ACTIONS LISTED ABOVE AND HAS BEEN IN CONTACT WITH THE DIVISION OF PARKS AND FORESTRY REGARDING THE REMEDIAL ACTIONS AT BEARFORT WATERS. FINALLY, I WOULD LIKE TO COMMEND MR. O'DOWD AND HIS STAFF FOR THEIR ACTIONS DURING THE RECENT EMERGENCY SITUATION AT THESE DAMS.

JAMES G. TON, COLONEL, CORP OF ENGINEERS CUSTOM HOUSE SECOND AND CHESTNUT STS PHILA PA 19106

APPENDIX

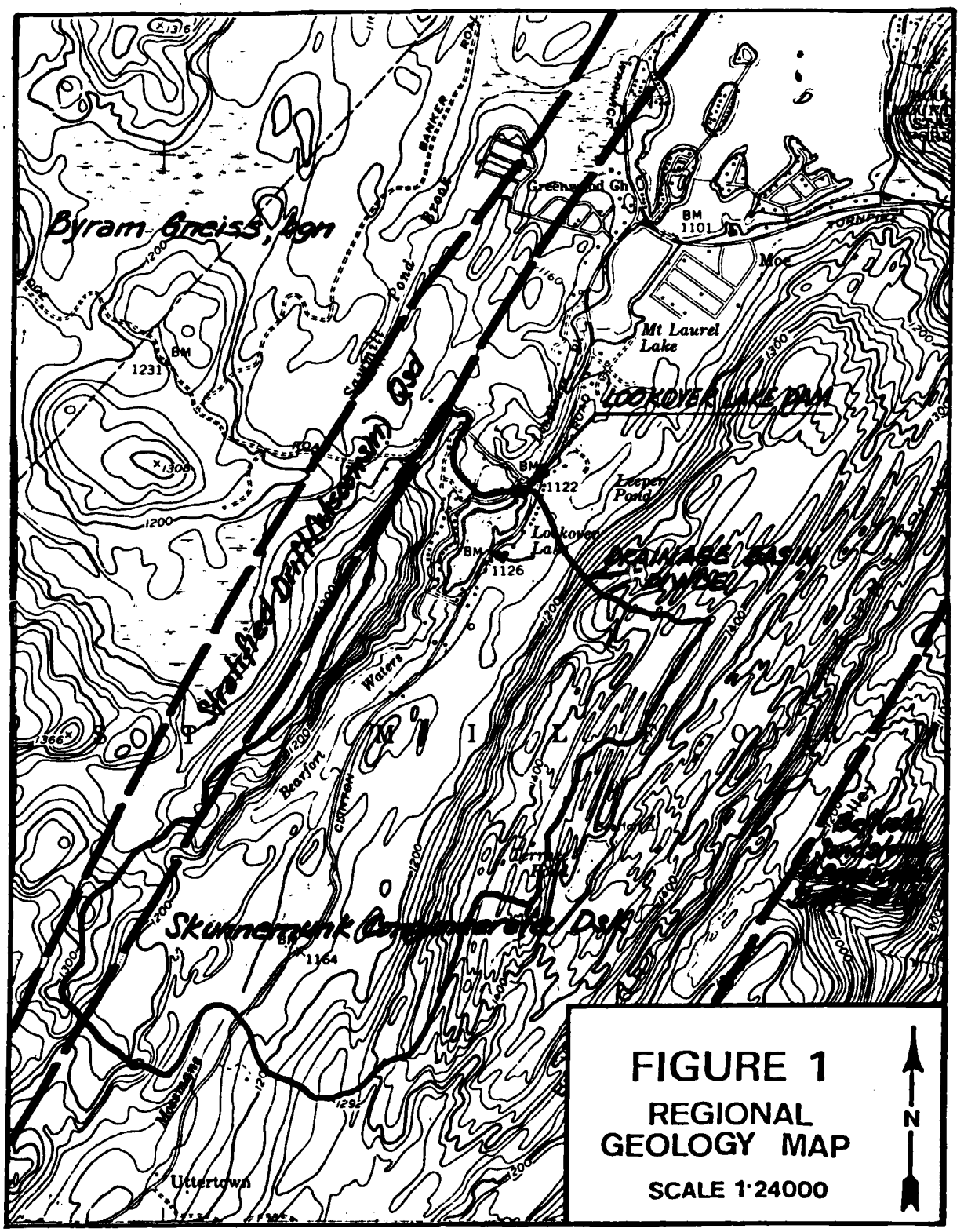
F

Site Geology

SITE GEOLOGY

LOOKOVER LAKE DAM

Lookover Lake Dam is located in the New England Upland Section of the New England physiographic province. Bedrock at the site is the Skunnemunk Conglomerate which is of Devonian origin and consists of coarse white quartz pebbles in a purple-red matrix with frequent beds of red sandstone. A small upstream portion of the watershed is underlain by stratified drift from the Wisconsin Glacial age. This drift is composed primarily of sand and gravel plains, deltas, eskers, kames and terraces.


Byram Gneiss
Stratified Drift (Esker)
Skunnemunk Conglomerate
Mt Laurel Lake
LOOKOVER LAKE DAM
Leeper Pond
Lookover Lake
DRAINAGE BASIN
Waters
Bearfort
Uttertown
BANKER ROAD
South Pond
Brook
BM 1231
BM 1122
BM 1126
BM 1101
1316
1366
1164
1200
1160
1300
1400
FIGURE 1
REGIONAL
GEOLOGY MAP
SCALE 1:24000
N